

# **Summary Report**

***Ecosystem-Based Management Working Group's***

***Adaptive Management Framework Development  
Expert and Practitioner Workshop***

**Vancouver: November 1 & 2, 2007**

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## Disclaimer

This report was commissioned by the Ecosystem-Based Management Working Group (EBM WG) to provide information to support full implementation of EBM. The conclusions and recommendations in this report are exclusively the authors', and may not reflect the values and opinions of EBM WG members.

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## Executive Summary

This report summarizes the proceedings of the Adaptive Management Framework Development Expert and Practitioner Workshop, hosted by the Ecosystem-Based Management Working Group (EBMWG). The workshop was held in Vancouver, November 1<sup>st</sup> and 2<sup>nd</sup>, 2007.

### Workshop purpose and attendees

The workshop brought together experts and practitioners in the areas of Adaptive Management (AM) and Ecosystem-Based Management (EBM) to begin to develop an AM Framework (AMF) for implementing EBM in BC's North and Central Coast. Results from the workshop will contribute to the development of a Request for Proposals (RFP) to design the AMF. The workshop agenda can be found in Appendix A.

Thirteen participants attended from a variety of professions or sectors, including academics and consultants in the areas of natural resource management and social science, foresters, and provincial and municipal government staff. The Participant List can be found in Appendix B.

A number of observers and invited guests also attended the workshop. The observers were seven members of the EBMWG's Adaptive Management Program Subcommittee and the Director of the EBMWG. Invited guests included EBM/AM practitioners, and representatives from the Land and Resource Forums and the Plan Implementation Monitoring Committees. Guests participated in question and answer sessions in the afternoon of both workshop days.

### Presentations

Five presentations were given to workshop participants to help scope the task of developing an AMF and to stimulate ideas. The first presentation provided background information on the EBMWG and the land use planning context in which the AMF is being developed. A summary of the workshop's land use planning and institutional context can be found in Appendix D.

The second presentation provided a summary of the North and Central Coast Land Use Plans (LUPs). The summary organized objectives, goals, strategies, indicators and targets from the following documents:

- Draft Ministerial Orders (now legal Land Use Objectives),
- First Nation and Provincial Government agreements,
- EBM Handbook,
- Land and Resource Management Plans.

A number of observations arose from preparing the summary and examining results. For example, even though the objectives provide good coverage of many land use issues, gaps exist in the management model, e.g., missing objectives, few HWB strategies, incomplete or missing equations/models linking objectives with indicators and strategies.

Participants made a number of observations about the LUPs, for example, that HWB objectives and indicators may be mutually exclusive or negatively impact each other, and that the relationship of LUPs to local planning is unclear.

The third presentation gave an overview of AM – including a model of an AM cycle – and ideas for the application of AM in an EBM and BC coastal context. Among the points highlighted in the presentation were a set of core questions the AMF must be designed to answer:

- Did we do what we said we were going to do in terms of implementing EBM?

- Have we been successful in maintaining or enhancing the twin goals of EBM: Ecological Integrity (EI) and Human Well-Being (HWB)?
- What actions have been or are likely to be most effective to (further) enhance EI and HWB?

Key, relevant success factors for AM were listed, including leadership and partnership, clear links to planning or decision-making processes, structured learning through comparisons, and early and systematic partner/stakeholder engagement. Participants pointed out that examining and monitoring alternative management options and their effect on EI and HWB is important, as is designing an AM process that identifies and responds to the learning needs of key stakeholders and decision-makers at all relevant scales.

The fourth presentation provided information on a monitoring program taking place in the Babine watershed. It is based on a framework that uses risk and uncertainty to identify learning priorities, aid decision-making, and act as a first screen to prioritize monitoring projects. Given the relevance of this model, the presentation covered many aspects of developing and applying the Babine Monitoring Framework. Some of the lessons learned from developing and using the Framework include:

- The need to devote time to develop an effective approach;
- The importance of establishing a method that allows users to move beyond implementation monitoring and carry out more sophisticated effectiveness and validation monitoring;
- The need to strike a balance between introducing more scientifically meaningful indicators and maintaining existing indicators in land use plans worked on and approved by communities;
- The usefulness of risk curves as a simple yet effective tool, enabling the comparison of different objectives for prioritizing projects, and the identification of the type of monitoring required for a project, i.e. implementation, effectiveness, or validation;
- When inconsistencies or competing objectives and/or strategies are identified, the need to communicate this back to the community that defined them to seek adjustments.

Participants commented that risk curves are good tools for moving forward in the face of uncertainty, and therefore, have relevance for assisting with decision-making and operations on the North and Central Coast.

The last presentation provided information on the way Participatory Action Research (PAR) is used to do community-based natural resource management and work toward HWB objectives. Some key factors of success for PAR projects include a commitment of time and resources over many years, investing in productivity, creating/strengthening local institutions for resource governance, and starting where you can succeed (aligning the project with local people's common interests and priorities, even if these are not directly tied to land or resource use).

#### Key workshop themes, issues and discussion points

Numerous topics, issues and ideas on developing an AMF emerged from workshop discussions. On the subject of AMF use, participants were told that the Provincial Government with First Nations will be using the AMF, with the expectation that implementation partners will apply guidance provided by the framework and feed monitoring information back for use by governments. Participants also found out that the AMF will be linked to the adaptive management plans referenced in new Land Use Objectives (LUOs), and that implementation partners may include licensees and funding organizations such as the Forest Investment Account (FIA).

Recognizing that human “agency” (i.e. the ability to act on self-interest and modify behaviour) creates differences between HWB and EI projects, participants discussed ways to develop hypotheses or models specifically for relationships among HWB variables. Participants pointed out the difficulties in modeling HWB relationships due to the range of social and cultural influences affecting HWB outcomes. It was also noted that the large number of HWB indicators in the LUPs shows the weakness of predictive modeling in social sciences, and that this uncertainty needs to be captured in models. Given our lack of understanding of HWB, some participants argued for a more fundamental initial focus: define and measure what the components of HWB are rather than develop and test hypotheses on the effectiveness of different activities to improve it. Others advocated a more pragmatic approach, pointing out on-going economically-oriented activities that could benefit from effectiveness monitoring. Participants agreed that the scope of HWB projects must expand beyond economic objectives.

The lack of HWB strategies in the LUPs led to ideas for developing more strategies. An approach focusing on strengthening existing community activities and initiatives was suggested. This would help people find ways to overcome obstacles they currently face and facilitate improvement. On a more fundamental level, it was suggested that improving HWB requires our processes and actions to address underlying issues of power and marginalization, for example, in the education system or with regards to ownership and use of land.

Since the LUPs contain many HWB indicators, participants discussed how to further develop and prioritize these. It was suggested that a process be established in communities as a way to capture local values, and that potentially diverse local results could be nested within a broader framework where objectives may be held in common. Examples of possible criteria for prioritizing indicators include:

- Areas in which management actions could have a direct influence on an indicator;
- Common indicators which could facilitate roll-up into broader scales;
- Indicators tied to the land-base to provide linkage to the LUPs;
- Indicators tied to immediate actions that could improve HWB in the short term.

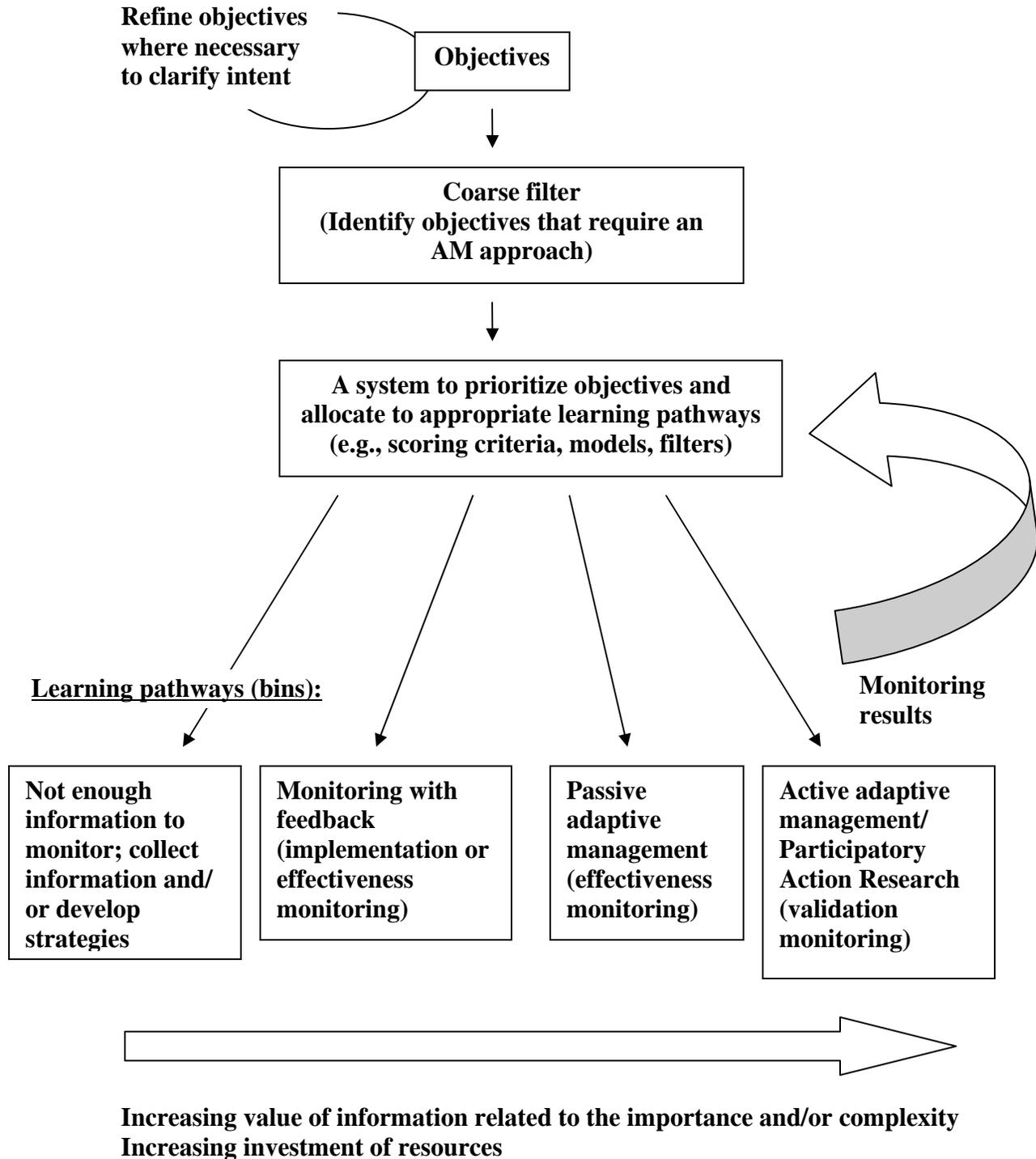
It was suggested that the design of an HWB indicator selection process would create a fault line between aboriginal and non-aboriginal communities due to conflicting interests and aspirations. In response, it was recommended that we identify what is common, and focus on creating a new relationship between aboriginal and non-aboriginal peoples.

Given the role of experimentation in conventional AM projects, participants had differing opinions on how this approach may be viewed from an HWB perspective. Some believed it is best to avoid the use of the term “experiment”, while others believed economic and social policies carried out across the province are already forms of “experiments” with humans. It was suggested that communities will accept the need to learn through this initiative in order for us to address areas of uncertainty.

Participants agreed that to develop an AM framework for implementing EBM, our understanding of AM needs to expand beyond the conventional experimental, “active AM” approach, to include other passive AM approaches to rigorous, structured learning to improve management.

Participants sketched out a broad “management learning framework” featuring different pathways of rigorous, structured learning (represented by “learning bins”), which would address what we need to know about how to achieve EI and HWB objectives. A synthesis of participants’ ideas on potential steps in this framework, encompassing both EI and HWB dimensions, is presented below.

## Synthesis of potential steps in an Adaptive Management Framework



A number of possible filters to prioritize objectives and allocate them to appropriate learning pathways were identified. Some of these include risk of not achieving an objective, uncertainty in the relationship between an objective and strategy/ implementation indicator, and willingness to change management actions. The first of these two filters imply the need for initial hypotheses about risk and uncertainty in the relationships between objectives and strategies. Participants recognized that designing the filters of the framework needs to involve communities and stakeholders to ensure relevance and commitment, and applying the filters must be done in a transparent fashion.

Following the identification of learning pathways and priorities for monitoring and research, actual AM projects would occur that would be used to improve knowledge and decision-making.

Participants discussed ideas for institutional structures and methods to ensure monitoring information would be effectively fed back to decision-makers and other relevant parties. Key points included the need to up-stream the information sharing process by getting information to relevant communities and decision-makers at the study design stage, to share monitoring data with communities in an accessible and cost-effective way, and the need to establish/assign a science body – such as the EBMWG – to take on the responsibility for translating monitoring results into possible management implications for presentation to decision-makers. From a broad perspective, participants highlighted the need to create stronger links between the strategic decision-making level of operations and the field level, and suggested developing a liaison level in between, where organizations and individuals would work to ensure an effective two-way flow of information throughout all levels. It was emphasized that AM will help describe and structure monitoring information, but is not the tool for making value-based decisions, e.g., setting targets, prioritizing or trading off objectives.

Many opportunities for supporting local capacity building as part of the AMF initiative were identified. Some examples include community involvement in defining selection criteria for objectives and screening AM projects. Another suggestion focused on developing local institutions to manage land and resources, such as localized AM committees that could work with communities within the broader institutional setting. It was recommended to identify existing groups at the appropriate scale who could make management recommendations, e.g., Timber Supply Area Steering Committees. A key challenge highlighted is to establish and maintain simple mechanisms for information flow among operations and throughout the region.

Participants began to explore ways to engage licensees in AM projects. They agreed that AM can appear attractive since it provides an opportunity to apply “flexibility” to constraints, e.g. as outlined in existing LUOs, licensees can apply a more ecologically risky management strategy if they also develop an AM plan (if “practicable”). It was pointed out that engaging licensees in investigating and addressing their areas of interest and concern will build their participation. It was suggested that Forest Stewardship Plans should be linked to the guidance about adaptive management from the framework being developed, and that there is a need to find ways to engage licensees on HWB issues.

Linkages with the FIA for funding and supporting AM initiatives was explored, including the use of proposal assessment criteria based on the AMF and projects identified by the EBMWG. It was also pointed out that the development of the AMF could provide products that FIA and other funders could adopt which would allow for standardization of AM projects (e.g., templates).

Various aspects to engaging First Nations Traditional Ecological Knowledge (TEK) in an AM process were explored, highlighting the need to engage TEK practitioners and experts early to structure the problem and define how it will be addressed and evaluated. Other points included the importance of seeking out and engaging the actual knowledge holders of the community,

and developing methods and protocols to ensure TEK is used in collaborative and appropriate ways at all project levels. The Ungulate Winter Range (UWR) initiative on the Central Coast was cited as a model worth studying.

Participants generated a number of roles and responsibilities the EBMWG could carry out to further support the AM initiative. Examples include: initially reporting out on a set of core indicators to gauge success; selecting projects to implement (ones already allocated to their appropriate learning bins) based on EBMWG priorities; developing an effective way to translate monitoring results into implications for management and include recommendations; and providing guidance to communities and stakeholders throughout the stages of the AMF.

Given the long-term nature of the AM initiative, participants agreed that ongoing institutional support was critical, and could be provided by a central body such as the EBMWG or a combination of groups. The overall purpose of a central body would be to facilitate the formation and continued operation of an EBM and AM community of practice. Examples of specific roles include acting as a clearing house for compiling and cataloguing information, and providing training to communities and resource managers on how to do AM. It was suggested that this body should improve upon and connect with existing, related processes in the region. Models worth considering include Bulkley Valley Centre for Natural Resources Research and Management, Saskatchewan Forestry Centre, and the Fraser Basin Council among others.

Participants identified a number of sources for standards to guide monitoring and AM experiments. These ranged from PAR research protocols for HWB projects, to extended peer review processes, to specific guidelines for various kinds of EI monitoring. It was pointed out that the AM initiative offers an opportunity to establish a system with standards before multiple projects are implemented, which would enable scaling up to occur in a coordinated and comparable fashion. At the same time, there needs to be flexibility in choosing among standards to meet project specifics.

At the end of both days of the workshop, invited implementation partners and EBM/AM practitioners discussed a number of issues with workshop participants. In response to concerns about the perceived complexity and cost of the AMF being developed, it was pointed out that the AMF is flexible in application, and could initially be used to organize existing initiatives so information generated will more effectively contribute to management decisions. This would harness money currently being spent. It was also pointed out that the cost of developing the Babine Monitoring Framework was approximately one dollar/hectare, and the upfront work and complexity has been very important to ensure the work on the ground has real meaning. It was agreed that the RFP should identify sources of funding to ensure diversification.

Other topics discussed with invited guests included how the AMF ensures a structured learning approach, the scope of HWB objectives and strategies, the legal status of the AM initiative and its relationship to existing agreements, and the need for extended peer reviews of AM projects.

At the close of the workshop, the next steps to be pursued by the EBMWG in developing and testing the AMF were outlined. These include designing and issuing an RFP for the development of the AMF and selecting a successful consulting team in early 2008. The EBMWG also has a project called “experimental watersheds” to identify potential watersheds where active AM experiments could be carried out; some of these experiments could start as early as spring 2008. Plans are to link this project to the AMF.

## Key requirements of a Terms of Reference for an RFP to develop the AMF

One of the workshop's objectives was to identify key requirements of a Terms of Reference for an RFP to develop the AMF. General recommendations included keeping the AMF as generalized as possible, ensuring TEK is engaged in all steps of the framework, and developing an inventory of potential HWB actions and strategies.

A variety of specific requirements were generated. Examples include:

- Define and develop the models, filters and learning bins for prioritizing objectives and allocating them to learning pathways. Build on suggestions from workshop participants regarding coarse and fine filters and relationships among filters and models;
- Develop filters to assess linkages between HWB objectives and actions;
- Develop models of the relationships between objectives and strategies/indicators that are as simple as possible, but provide a hypothesis to test, e.g., concept maps, risk curves. Some indicators will require refinement and the intent of some objectives will be clarified in this process;
- Prioritize objectives and categorize them according to learning pathways using the models and filters developed;
- Identify a core set of indicators with which the EMBWG can gauge and report the success of the AM initiative;
- Develop processes to effectively engage communities and stakeholders in testing and developing the AMF and selecting and implementing AM projects;
- Design a model for institutional and community learning from AM monitoring results that builds on concepts developed by workshop participants;
- Explore a link with the FIA to fund AM projects that would allow for standardization and comparability across scales;
- Identify other potential sources of funding for projects implementing the AMF;
- Recommend possible standards for the types of research applicable for each of the learning pathways/bins;
- Develop products (e.g., best practices and tools) for participatory/collaborative learning processes with communities and stakeholders;
- Develop products that FIA and other funders could use in their selection process that would facilitate standardization of AM projects (e.g., templates) to ensure rigour, consistency and data roll-up.

## List of Acronyms

AM	Adaptive Management
AMF	Adaptive Management Framework
BMF	Babine Monitoring Framework
CIII	Conservation Incentives and Investment Initiative
DSP	Detailed Strategic Plan
MO	Ministerial Order
EI	Ecological Integrity
EBM	Ecosystem-Based Management
EBMH	Ecosystem-Based Management Handbook
EBMWG	Ecosystem-Based Management Working Group
G2G	Government (First Nations) to Government (Provincial), e.g., G2G agreements
FRPA	<i>Forest and Range Practices Act</i> (BC Government)
FIA	Forest Investment Account
FSP	Forest Stewardship Plan
HWB	Human Well-Being
LRF	Land and Resource Forum
LRMP	Land and Resource Management Plan
LUO	Land Use Objective
LUP	Land Use Plan
PAR	Participatory Action Research
PIMC	Plan Implementation Monitoring Committee
RFP	Request for Proposals
SLUPA	Strategic Land Use Planning Agreement
TEK	Traditional Ecological Knowledge

# 1 Introduction

This report summarizes the proceedings of the Adaptive Management Framework Development Expert and Practitioner Workshop, hosted by the Ecosystem-Based Management Working Group (EBMWG). The workshop was held in Vancouver, November 1<sup>st</sup> and 2<sup>nd</sup>, 2007.<sup>1</sup>

The workshop brought together experts and practitioners in the areas of Adaptive Management (AM) and Ecosystem-Based Management (EBM) to begin to develop an AM framework for implementing EBM in BC's North and Central Coast. The workshop agenda can be found in Appendix A.

## Workshop goal and objectives

The goal of the workshop was:

*To build on existing models of Adaptive Management, as represented by the collective experience of working session participants, to provide recommendations on the design of an Adaptive Management framework for the implementation of Ecosystem-Based Management in BC's North and Central Coast.*

The objectives of the workshop were:

1. To build a common understanding of the role of AM in BC's North and Central Coast land use planning and agreements;
2. To identify key scientific and implementation issues in designing an Adaptive Management Framework (AMF) and the implications of their interactions;
3. To identify sources of information to draw upon in designing an AMF;
4. To identify key requirements of a Terms of Reference for the generation of an AMF for BC's North and Central Coast.

## Participants

Participants were chosen by the EBMWG based on a number of considerations:

- Knowledge of and/or direct experience with AM or EBM processes;
- To represent a wide range of ecological and social science perspectives;
- To represent partner organizations who will be involved in implementing EBM and the AMF on the North and Central Coast.

Thirteen participants attended from a variety of professions or sectors, including:

- Academics and consultants in the areas of natural resource management and social science,
- Foresters,

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<sup>1</sup> The report was prepared by Peter Abrams, Associate, Dovetail Consulting Inc, who facilitated and co-designed the workshop. The report is based on notes taken during the workshop by Susan Leech and Chris Hollstedt, and input from workshop presenters on their material. The report was reviewed by the EBMWG Adaptive Management Framework Development Project Sub-committee.

- Municipal Government – City of Prince Rupert,
- Provincial Government – BC Ministry of Forests and Range.

The Participant List can be found in Appendix B.

### ***Observers and invited guests***

A number of observers and invited guests also attended the workshop. The observers were seven members of the EBMWG's Adaptive Management Program Subcommittee and the Director of the EBMWG. The AM Program Subcommittee is responsible for overseeing the development of the AMF and associated deliverables. The observers were present throughout the workshop and occasionally contributed to discussions.

Invited guests included:

- EBM/AM practitioners;
- representatives from the Land and Resource Forums (the bodies overseeing and supporting the development of EBM and implementation of First Nations – Provincial Government land use agreements);
- representatives from the Plan Implementation Monitoring Committees (bodies tracking and evaluating the implementation of the land use plans).

These guests attended question and answer sessions in the afternoon of both workshop days.

### **Structure of the report**

This report is structured in seven sections:

1. Introduction
2. Summaries of presentations given on key topics
3. Key themes, issues and points emerging from workshop participants' discussions
4. Key themes, issues and points emerging from question and answer periods with invited guests
5. Next steps following the workshop
6. Recommended requirements for a Terms of Reference to develop the AMF
7. Appendices:
  - A: Workshop agenda
  - B: Participant list and contact information
  - C: Glossary of terms used
  - D: Summary of the workshop's land use planning and institutional context
  - E: Definition of "Full Ecosystem-Based Management by March 31, 2009"

## 2 Summary of Presentations

Five presentations were given to workshop participants to help scope the task of developing an AMF in an EBM context for BC's North and Central Coast, and to stimulate ideas on how to approach this task. The five presentations were:

- Background on the EBMWG and the Land Use Planning Context for Developing the Adaptive Management Framework
- Development of the Adaptive Management Framework
- North and Central Coast Land Use Plan Summary
- A Framework for Adaptive Management in an EBM Context
- The Babine Monitoring Framework
- Participatory Action Research and Human Well-Being Projects

Following are summaries of the five presentations.

### **Background on the EBMWG and the Land Use Planning Context for Developing the Adaptive Management Framework**

Alex Grzybowski, Director of the EBMWG, provided background on the EBMWG, and the role of an AMF in the North and Central Coast land use agreements and planning context. A summary of the workshop's land use planning and institutional context can be found in Appendix D.

Alex identified the entities involved with Government-to-Government (G2G) discussions between First Nations and the Provincial Government, including the three Land and Resource Forums (LRFs) – one for the North Coast First Nations, one for the Central Coast First Nations, and one for the N̓anw̓ak̓olas Council of First Nations in the southern portion of the Central Coast. The LRFs are responsible for overseeing the implementation of First Nations' Strategic Land Use Planning Agreements (SLUPAs), Land Use Objectives (LUOs), EBM, and the development and implementation of First Nations' Detailed Strategic Plans (DSPs).

Alex also pointed out the bodies and processes responsible for and/or engaged in delivering on land use decisions, including the EBMWG, Plan Implementation Monitoring Committees (PIMCs), First Nations resources offices, local government and third parties.

Alex described how AM will be a key part of implementing EBM successfully on the coast, as it will provide important feedback on how better to achieve the twin EBM goals of Ecological Integrity (EI) and Human Well-Being (HWB). He pointed out the variety of processes and actors involved in designing, implementing, learning from, and adjusting EBM projects. These include the EBMWG, PIMCs, LRFs, SLUPAs and DSPs, Forest Stewardship Plans (FSPs), and various capacity building and economic initiatives.

One of the EBMWG's responsibilities and deliverables is to develop a framework that will support the full implementation of EBM as agreed to in the G2G process. Alex built on this point, outlining the key deliverables in the EBMWG workplan:

- Developing an AMF;
- Providing analytical support for First Nations' DSPs;
- Developing HWB indicators, targets, baseline and strategies;
- Developing EI indicators, focal species, and baseline.

With respect to developing the AMF, Alex outlined some of the challenges:

- Ensuring it is based on a foundation of good science – asking the right questions, and identifying appropriate standards;
- Ensuring that the AMF can be implemented. Considerations include the need to:
  - prioritize and integrate projects,
  - provide for institutional linkages related to financing, implementing specific projects, and utilizing the results to inform decision-making and information management;
- Defining the separation from and the linkage to decision support and analysis.

Alex illustrated how the achievement of EBM is built on the foundation of four elements:

1. HWB: socio-economic policies and initiatives.
2. EI: conservation measures that seek low ecological risk.
3. A governance framework that designs, implements, evaluates and adjusts EBM on an ongoing basis.
4. AM: a system that supports further development and implementation of EBM. Elements related to AM include:
  - a) monitoring and evaluating EI and HWB,
  - b) independent research, and an inventory and data management system,
  - c) a decision support/analysis system.

Alex confirmed that results from this workshop will contribute to the development of a Terms of Reference for a Request for Proposals (RFP) to design an AMF.

## **North and Central Coast Land Use Plan Summary**

Dave Daust, a consultant, presented information on the summary of the North and Central Coast land use plans (LUPs) he and another consultant – Karen Price – produced. Key topics and presentation points follow.

### ***Source documents and methodology***

The LUP summary organized specific information (i.e. objectives, goals, strategies, indicators and targets) from the following documents:

- Draft Ministerial Orders (MO),<sup>2</sup>
- First Nation and Provincial Government (G2G) agreements,
- EBM Handbook (EBMH),
- Land and Resource Management Plans (LRMPs).

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<sup>2</sup> In July 2007 and January 2008, after G2G negotiations and public consultation periods, the Minister of Agriculture and Lands established legal land use objectives for the North and Central Coast by order pursuant to Section 93.4 of the *Land Act*. The term “Land Use Objective” (LUO) is more commonly used than MO or “legal objectives”.

To create the LUP summary, the information from the various documents was compiled and condensed. Results from this process include:

- Tables linking implementation indicators and targets to objectives, identifying differences in target levels according to source document, e.g., MO, G2G, EBMH, etc
- Examples of concept maps modeling linkages among a variety of indicators to objectives for achieving EI and HWB goals.

### ***Observations on content***

Preparing the LUP summary and examining the results led to the following observations:

- Land use plans define the general scope and provide some structure (i.e. variables derived from objectives and indicators, and connections among variables) for the “land management model” being applied to central and northern coastal BC. Such models (or structured hypotheses) provide a basis for both management and monitoring decisions.
- There is good coverage with objectives, i.e. many important factors are identified, but the plans fail to provide a complete model:
  - Objectives related to specific rare and focal species and free ecological services are missing, as are influential variables that were considered unmanageable (due to natural factors or falling under other jurisdictions),
  - Equations linking variables together are not described and, in some cases, general connections among variables are not shown (models are ill-defined or poorly documented),
  - There are objectives with no time frame,
  - There are few HWB strategies except in the LRMPs,
  - Some indicators are missing or weak,
  - Some targets are missing or weak, for example, there is no target for developing new health education programs,
  - Targets for some indicators are inconsistent among documents;
- For some topics, relatively complete models may exist elsewhere (e.g., in the Scientific background to EBMH<sup>3</sup>).

### ***Key points from follow-up discussion***

- Some HWB indicators and objectives may be mutually exclusive or have a negative impact on each other. For example, strategies addressing economic growth might negatively affect or impact some other aspect of local life that the community cares about;
- AM helps describe the relationships and uncertainty between factors, but is not the tool for value-based decisions, e.g., setting targets, prioritizing or trading off objectives;
- It is not clear where local plans are taken into account, for example, regional district or municipal plans;
- The economic aspect of HWB tends to be emphasized over education, culture, health, etc.

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<sup>3</sup> See <http://www.citbc.org/ebmscie.html>

- Identifying specific HWB strategies presents unique challenges due to the ability of humans to independently make and subsequently modify their behaviour and perception of well-being.
- We need to understand what “full implementation of EBM” means (definition provided in Appendix E).

#### Ideas for the development of the AMF:

- Characterize the uncertainty around relationship between strategies and objectives;
- Include links, or mechanism to link indicators across and within EI and HWB;
- Involve local communities in deciding what values/attributes/objectives they want to study using an AM approach. The EBMWG can support this process by identifying indicators that would be meaningful to track;
- Involve community leaders and local government in addressing contradictory HWB strategies and objectives;
- Feed monitoring data back to local communities for “next steps” decision-making;
- Involve the science community in the AM process for both EI and HWB to provide rigour;
- EBMWG needs to develop and communicate a realistic scope of their work.

### **A Framework for Adaptive Management in an EBM Context**

Lee Failing presented an overview of AM and ideas for its application to support the implementation of EBM. Key subjects and presentation points follow.

#### ***What is Adaptive Management?***

AM is a systematic approach for improving resource management by learning from management outcomes. It is not just monitoring activities and occasionally adjusting them. It involves:

- Exploring alternative ways to meet management objectives;
- Predicting the outcomes of alternatives based on the current state of knowledge;
- Implementing one or more of these alternatives;
- Monitoring to learn about the impacts;
- Using results to update knowledge and adjust management actions.

In this way, AM helps to describe the relationships between objectives, strategies, etc, and can reduce uncertainty in our existing knowledge. Though learning plays a key role in AM, it is seen here as a means to an end, namely good management, and not an end in itself.<sup>4</sup>

#### ***Conditions for using AM***

Conditions that warrant the use of AM include:

- A management decision is to be made;
- There is an opportunity to learn;

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<sup>4</sup> US Department of Interior. 2007. Guidelines for Adaptive Management.

- There is willingness to change - a high value is put on monitoring information for decision-making.

AM must consider:

- decisions made and those still to come;
- multi-objective decisions;
- multi-scale issues;
- the roles of implementing partners.

### ***AM in the North and Central Coast EBM context***

Land use planning decisions for BC's North and Central Coast have been made (e.g., LRMPs, G2G). More are continually being made by multiple parties at multiple scales. Collectively, these are the suite of novel forest management and conservation techniques being applied across the region to achieve the objectives of EBM. EBMWG's core task is to monitor the outcomes of LRMP/G2G decisions to determine if they achieve the EBM objectives and to inform future decisions. More broadly, the steps outlined in the AMF should set the standard for what is meant by "doing AM" in an EBM context. They can be used by anyone to support EBM-related management and decision-making that maximizes learning and feedback.

For the EBMWG, the core questions the AMF is designed to answer are:

- Did we do what we said we were going to do in terms of implementing EBM?
- Have we been successful in maintaining or enhancing EI and HWB?
- What actions have been or are likely to be most effective to (further) enhance EI and HWB?

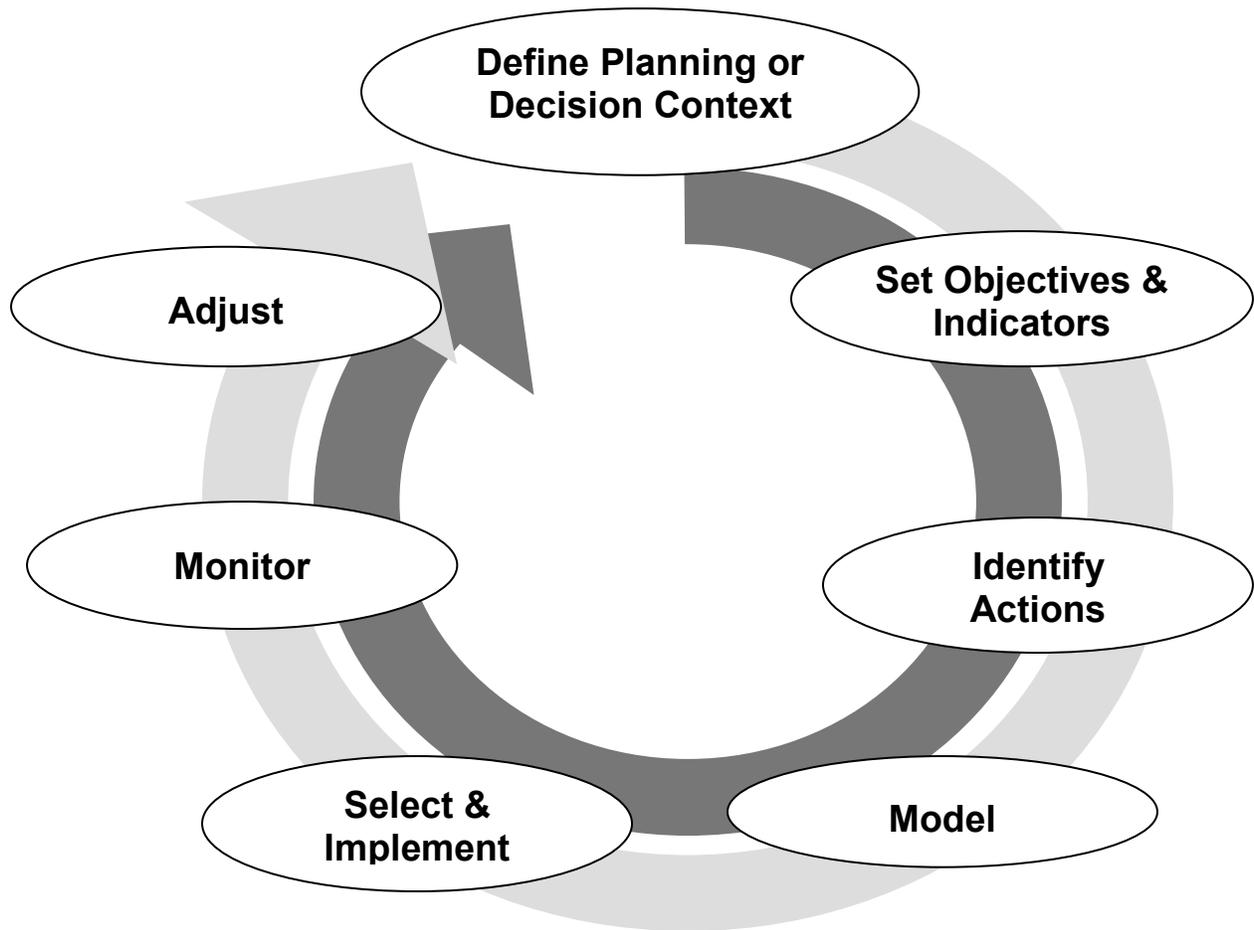
### ***The AM Cycle and its steps***

There are a variety of ways to describe the AM cycle, some emphasizing an experimental approach, others outlining general planning with commitments to learning but little explicit structure for it. The cycle proposed here focuses on the planning and decision-making process, emphasizing structured learning. This cycle is selected because:

- recent approaches to AM suggest that the link to decision-making is essential for ensuring the relevance and on-ground use of AM results;
- it can be applied to both EI and HWB – the twin goals of EBM.

The basic steps in the AM cycle are shown in the following figure and described below. Different approaches use slightly different names for the steps, but the nature of what must happen at various stages is similar. For reference, an alternate name is shown in brackets for some steps.

**Figure 1: Steps in an Adaptive Management Cycle**



Define Planning or Decision Context (Assess Problem)

Define the decision(s) under consideration. What decision are we trying to inform? When are they required? Who should be involved (stakeholders)? What problem are we trying to solve? What are the scope and bounds of what is under consideration?

*EBMWG Approach:*

- For the EBMWG’s core work, the key decisions under consideration are the LRMP/G2G agreements.<sup>5</sup> The decision context is simply that the decisions have been made and may be revised as information improves.
- For non-core work, the framework should serve as a guide for other plans and decisions related to EBM implementation that the EBMWG may be asked to support and that other parties may address. Examples include:
  - What can we do as a community to enhance employment stability/economic diversity?
  - What can we do as a forest company to enhance interior forest habitat?

<sup>5</sup> Examples related to forest ecology include new conservancies, hydro-riparian reserve networks/buffers, regional/landscape/watershed old growth representation targets, and stand-level retention.

### Set Objectives and Indicators (Design)

Define the objectives and indicators that will be used to evaluate management actions and report progress. The EBMWG will develop a core set and encourage others to use them in reporting costs/benefits of EBM actions.

#### *EBMWG Approach:*

- Summarize current agreements and reference documents (project AM01: LUP Summary) to serve as starting point;
- Modify as required to develop a complete, concise, consistent set of objectives and indicators that can be used as basis for monitoring;
- The objectives and indicators define what is meant by EI and HWB – what the EBMWG will use to evaluate whether or not EI and HWB are being enhanced or maintained.

### Identify Actions (Design)

Define a list of actions that are either a) underway or b) under consideration for the future.

#### *EBMWG Approach:*

- Summarize current agreements (AM01: LUP Summary) to serve as starting point;
- Develop a concise summary of the core actions that will be evaluated as part of the AM framework;
- Develop a representative list of other actions that will need to be evaluated/monitored.

### Model (Knowledge Summary)

Develop “models” to describe the hypothesized relationship between objectives and actions. These could be complex quantitative models, or simple conceptual models built on expert judgment. These “models” are living, continually updated models that reflect our evolving understanding of the systems we’re managing (ecological and human).

Keep models as simple as possible. The goal is to enhance learning by allowing comparison between expected and observed outcomes. Over time, this will lead to improved hypotheses and predictive capability.

#### *EBMWG Approach:*

- Establish current condition of indicators (baseline);
- State explicit hypotheses about relationship between actions (which can be stated as target levels of implementation indicators) and objectives, and between objectives and goals;
- Update models with new information (from Adjust stage).

### Select and Implement (Implement)

From the set of candidate actions, decision-makers select and implement a set of management actions based on our understanding of the relationship between actions and objectives (from the previous step). The AMF provides structured information to the decision-makers; it does not make any decisions.

For implementation, the AMF structures the selected actions in a way that can provide learning through comparison, either to benchmark conditions (controls, pre-harvest condition), to status quo activities, or to *a priori* targets.

### *EBMWG Approach:*

- In an ideal cycle, we would do all this before selecting actions. In the real world, we have actions that have already been agreed to/adopted via LRMPs/G2Gs, in some cases without any explicit model of how they will perform.
- For the core decisions: acknowledge that the actions have already been adopted.
- For new decisions: it is at this step that we explicitly evaluate alternative actions.

### Monitor

Based on the selected management actions, design and implement a monitoring program to a) report on status/success of implementation, and b) test the effectiveness of the selected actions in achieving the objectives – a mechanism must exist to capture the learning's through clear problem statements/questions and relevant comparisons.

### *EBMWG Approach:*

- Identify monitoring needs (long list);
- Prioritize them (explicit scoring system);
- Design monitoring plans;
- Establish standards for monitoring;
- Implement them.

### Assess and Adjust (Feedback)

This is the stage that usually fails, and thus, this cycle emphasizes the link between monitoring and decision-making.

Assess monitoring results using structured learning comparisons related to key uncertainties related to proposed management actions and decide whether a review of the decision is needed. In some cases, there may be a need to revisit the problem/decision context, revisit objectives and add new actions to the list of actions to consider. In others, it may be just a matter of deciding to evaluate/implement a new action without revisiting objectives/indicators.

### *EBMWG Approach:*

- Assess monitoring results;
- Update models as appropriate;
- Identify new actions as appropriate;
- Assess whether the objectives/indicators need revision;
- Consult with stakeholders about the above;
- Report out on any implications for review of decisions.

## ***Key success factors for AM***

There are many success factors for AM that are well documented elsewhere. A few that seem particularly relevant for our application include:

- Leadership and partnership;
- Clear links to planning or decision-making processes. For example, partners and stakeholders need to establish “change statements” defining how their operations will change as a result of the monitoring information generated from AM projects. Examples:
  - “The LRFs will use the monitoring information to determine whether a review of the actions outlined in the Central Coast LRMP is warranted”;
  - “The EBMWG will use the information to decide whether to recommend a review of in-stand retention guidance in the EBMH.”
- Relevant science;
- Explicit hypotheses;
- Explicit objectives and performance metrics;
- Structured learning through comparisons;
- Early and systematic partner/stakeholder involvement;
- Shared understanding among partner/stakeholder of how monitoring results are assessed, and as a result, what may need to be adjusted/what decisions may need to be reviewed, and the partner/stakeholder’ roles in these steps;
- Recognition of and constructive approach to trade-offs;
- Commitment to ongoing monitoring.

## ***Products from the AMF***

The development and use of the AM framework will generate a number of products for use by the EBMWG and implementing partners, potentially including:

- LUP Summary of existing agreements;
- Inventory of action underway and under consideration, in part from LUP summary;
- A decision matrix and change statement(s);
- Conceptual maps for EI and HWB;
- “Working” set of core indicators;
- Current status of indicators (project to establish baseline underway);
- Explicit hypotheses;
- Simple models based on a mix of data and expert judgment (to be continually updated);
- Case study(ies) showing the use of multi-attribute information generated by the AM program;
- Explicit system for prioritizing monitoring, research, inventory needs according to their utility for management/decision-making;
- A learning plan, including but not limited to monitoring;
- Standards / guidelines for monitoring;

- A baseline against which progress can be compared (project to establish baseline underway).

### ***Key points from follow-up discussion***

- Implementation indicators are often used because this can be measured. But we need to keep in mind “effectiveness”.
- Key to doing something useful in adaptive management is looking at and monitoring alternative management options and their effect on EI and HWB.
- We need to be clear on the scale we want to work at.
- We need to consider who needs to learn – key stakeholders and decision-makers at all relevant scales – and design a process that builds their commitment to learning and using AM information.

### **The Babine Monitoring Framework**

Karen Price and David Daust provided workshop participants with information on a monitoring program taking place in the Babine watershed. It is based on a framework that uses risk and uncertainty to identify learning priorities, aid decision-making, and act as a first screen to prioritize monitoring.<sup>6</sup> In the Babine Monitoring Framework (BMF), the term “monitoring” includes research and adaptive management where appropriate. Following are key topics and points from Karen’s presentation.

### ***Framework design requirements***

- The framework’s design had to meet the following requirements:
  - Enable feedback: strategies must be explicitly linked to objectives,
  - Present knowledge in a way that facilitates communication and learning (i.e. a single base of knowledge that uses graphical summaries),
  - Select priorities objectively,
  - Consider all types of monitoring (implementation, effectiveness and validation) simultaneously.

### ***Framework methodology***

- The BMF begins with the objectives and strategies included in existing land use plans. An initial assumption is that all objectives listed by consensus tables (e.g., LRMPs) are equally important and worthy of monitoring.
- Monitoring is first prioritized based on the risk of not achieving a desired objective using a management action (probability of being wrong and creating a severe negative consequence) and associated uncertainty (essentially a confidence interval around the risk estimate):
  - Determine risk based on current and future indicator values: current indicators come from the results of implementation monitoring; future indicator values are derived from existing land use strategies and/or targets.

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<sup>6</sup> See <http://www.babinetrust.ca/documents.html>

As an example, an objective may be to conserve biodiversity and a strategy may be to reserve old growth forest. A risk relationship would show how changing the amount of old growth reserved would affect the level of risk to biodiversity. Uncertainty would be shown as a band around the curve where we are uncertain about the relationship between the objective and strategy. Risk levels (e.g., moderate and high) would be read from the graph for current (e.g., 40% old growth) and future (e.g., 10% old growth) indicator states and then combined.

The relationship between the strategy and the objective is based on existing experience, expert advice and literature review.

- Low risk objectives with low uncertainty are eliminated.
- Objectives receive high priority for :
  - implementation monitoring if information is insufficient to complete risk analysis,
  - effectiveness monitoring if estimated risk is high with low uncertainty,
  - validation monitoring if uncertainty is high.
- Within risk classes, objectives are then run through a filter to prioritize them by importance based on other factors, such as:
  - can we do it (is the uncertainty resolvable),
  - ease (what is it going to cost to do it),
  - importance of the objective in relation to the goal (e.g., if road density [objective] in an area has a greater influence on grizzly bear population [goal] than available habitat [objective], one would choose to monitor and study road density over habitat, all else being equal),
  - influence of goal on other goals (e.g., fish populations influence grizzly bears and recreation, while recreation does not influence other goals),
  - recovery (to the pre-management state of the objective. For example, old growth structure takes over 100 years to recover, visual quality recovers in 30 years, and shade to streams recovers in 5 -10 years).
- A list of monitoring priorities for implementation, effectiveness and validation monitoring is produced.
- Decision-makers then choose the top priority topics from the three types of monitoring.
- As well as prioritizing monitoring, the BMF identifies inconsistencies between objectives and strategies. For example, if the risk of not achieving an objective is high and the uncertainty low, then adjustment is required to either the objective or the strategy.

### ***Risk and uncertainty curves***

- The use of risk and uncertainty curves provide many benefits, including:
  - an effective approach for developing explicit hypotheses about relationship between objectives and indicators;
  - a means to communicate information and focus discussions;
  - a good applied learning tool since they are updatable as learning progresses;
  - a significant contribution to the monitoring prioritization process;
  - a means to compare a diversity of objectives (same Y-axis and consistent Y-values, i.e. level of risk of not achieving the objective being examined);

- a way to inform the types of monitoring required (implementation, effectiveness, validation);
- an effective means to move beyond implementation monitoring by allowing people to prioritise all three types of monitoring together;
- in combination with a secondary ranking, a method to order projects for completion.

### ***Institutional structure***

- The Babine Watershed Monitoring Trust is the body responsible for the monitoring program and determines what research projects to fund.
- The Trust is responsible for translating and communicating monitoring results in a way that helps the learning and decision-making process.
- Beyond the standard research report, a formal process exists for reporting findings to the Trust: for every project, results and proposed updates to the knowledge base are captured in a 2-page summary and presented to the Trust.
- The Trust can recommend changes to the knowledge base (for example, to the risk models or current risk level).
- The Trust does not recommend changes to objectives or strategies, but passes on results of risk assessments that suggest changes are required. This information goes to the body responsible for updating objectives and strategies: the Community Resources Board.
- The Community Resource Board represents various values and perspectives from the community and is an LRMP implementation committee.

### ***Applying the framework***

- A complete list of existing objectives from the six land use plans for the Babine was compiled and consolidated, and presented to stakeholders for review.
- 106 objective/indicator pairs were identified and approximately 50 had sufficient information to complete risk analysis:
  - Remainder need implementation monitoring,
  - 27 were a priority for validation monitoring,
  - 22 were a priority for effectiveness monitoring.
- Based on an understanding of the risk curves and their use, Trustees could agree on monitoring priorities and were able to select their list of projects in one meeting. Highest risk projects received priority and moderate risk was addressed based on available funding.
- There was only one project for effectiveness monitoring, which was done. The top 2 projects for validation were bumped off to proposal writing, and have subsequently been done.

### ***Lessons learned***

- An effective approach takes time to develop: the Babine approach evolved over the past few years.
- The Babine project cost less than \$40,000, including the land use summary and the entire knowledge base.
- Creating risk curves can be done in one day per goal.

- Other monitoring programs have tended to get stuck on implementation monitoring: most effort was spent on implementation monitoring, less on effectiveness monitoring, and very little on validation monitoring, adaptive management and research. The BMF has allowed people to prioritize all three types of monitoring together, so in one year, the Trust might be doing implementation, effectiveness and validation monitoring.
- Implementation and effectiveness and/or validation monitoring can be linked, e.g., link monitoring to determine the existence of standing trees (i.e. riparian buffers) with project to determine how standing trees are contributing to a functioning riparian ecosystem.
- Indicators in land use plans may not be that informative. A balance needs to be struck between introducing more scientifically meaningful indicators and maintaining indicators worked on and approved by the community (and thus, reflecting community values).
- When inconsistencies or competing objectives and strategies are identified, communicate this back to the community that defined them to seek adjustments.

### ***Key factors of success***

- Secure “buy in” from the community when designing the monitoring program. In the Babine, stakeholders wanted a monitoring framework that could objectively select monitoring projects amongst multiple “values” such as wilderness experience, riparian ecosystems, and timber. This required comparing risk (and uncertainty) across all values.
- Engage stakeholders in helping to define the factors/criteria in the filter for selecting projects.
- Have experts willing to take the time to draw risk curves.
- Engage a group responsible for updating objectives and strategies, i.e. the management cycle.
- Establish a group to keep track of the knowledge base and projects, i.e. the learning cycle.
- Build and use credible knowledge sources (science, traditional and local knowledge).

### ***Key points from follow-up discussion***

- The BMF expresses relationships between strategies and objectives as hypotheses about risk and associated uncertainty.
- You need to consider objectives in the context of broader goals.
- Some objectives may be mutually incompatible--the BMF will point these out.
- If it looks as though a strategy will not achieve an objective, then either the strategy or the objective should be changed as they are incompatible.
- Indicators may be poorly defined. When an indicator is not appropriate, uncertainty around estimated risk is higher.
- A benefit of the BMF is that it takes you to whatever type of monitoring is needed.
- Risk curves are good tools to move forward in the face of uncertainty.
- In the North and Central Coast, risk curves adding uncertainty really helps because sometimes we are operating in areas with huge uncertainty.

## **Participatory Action Research and Human Well-Being Projects**

Stephen Tyler provided information on the way Participatory Action Research (PAR) is used to do Community-Based Natural Resource Management. His presentation is summarized by highlighting key factors leading to successful PAR projects.

### ***Key factors for successful PAR projects***

- A commitment of time and resources over many years:
  - It can take up to 10 years to evolve from a complicated, divisive situation to local sustainability,
  - Costs of projects (for research teams, travel, etc.) have been in the range of \$100,000 dollars per year;
- Researchers shifting their role from setting the research agenda to facilitating learning and management;
- Government agents shifting their role from enforcers to facilitators;
- Validation of local knowledge and use with scientific knowledge;
- Building on local methods of learning;
- Respecting rights associated with land and resource tenure, and including tenure issues in project scope;
- Understanding local decision-making processes;
- Presence of local leadership and support;
- Starting where you can succeed: aligning project with local people's common interests and priorities, even if priority needs are not directly tied to the land or resources;
- Building of mutual trust among community members and with project team through active facilitation and responsiveness to community needs;
- Involving key agencies from the beginning, e.g., engaging land use agencies in project design and joint learning;
- Collaborative learning among researchers, local project participants, and government staff;
- Networking with external groups to enhance learning and information sharing;
- Investing in productivity;
- Involving advocacy groups to keep government's "feet to the fire";
- Influencing policy and decision-making processes;
- Creating/strengthening local institutions for resource governance;
- Linking local institutions with higher levels of government in power sharing arrangement.

### 3 Key workshop themes, issues and discussion points

Numerous topics, issues and ideas emerged from workshop discussions on developing an AMF to assist with the implementation of EBM on BC's North and Central Coast. Key themes, issues and associated discussion points are presented in this section. Diagrams used during the workshop are included.

#### Who will use the Adaptive Management Framework?

Clarification was sought by participants on who will be using the AMF.

- The AMF will be used by the Provincial Government with First Nations. Expectation is that implementation partners will apply guidance provided by the framework and feed information back to be used by governments.
- The AMF will be linked to the adaptive management plans that are referenced in new LUOs. This has similarities to Weyerhaeuser's work (biophysical only), where a licensee is involved in developing a plan, and university and government researchers are involved in design and research around the application of the plan.
- Actors may include licensees and funding organizations such as the Forest Investment Account (FIA).
- A suggestion was put forward to keep the AMF as generalized as possible to allow implementing partners (e.g., professional foresters) room for adaptation to the specifics on site.

#### Developing explicit hypotheses or models for Human Well-Being

Participants discussed ways to develop hypotheses or models about relationships among objectives, strategies and indicators for HWB.

#### *Concept of "agency"*

- A unique aspect of studying and trying to improve HWB in comparison with EI is the concept of "agency", i.e. the capacity to make choices and act. In a HWB context, "agency" has the following characteristics:
  - Individuals and groups have interests and can act on these to affect their well-being;
  - Independent decision-making and goal-oriented behaviour occurs, and actions can frequently change;
  - Interactions between researchers and agents can change agents' perspectives, objectives and strategies. For example, asking people about an aspect of their well-being may create less well-being by stimulating self-reflection and a perception of "lack".

The latter point creates both challenges and opportunities, since we are trying to achieve change.

## ***Range of influences affecting outcomes***

- The range of influences on social and cultural aspects of HWB makes it difficult to model relationships between strategies and HWB outcomes. An example of this difficulty:

How would we develop a hypothesis of the relationship between the number of First Nations speaking their original language and cultural vitality? We would need a rationale to justify a strategy, for example, an investment into a cultural centre with language programs for the next 30 years. We could measure an increase in the number of people speaking their original language, but how would we measure whether more people are appreciating their culture?

This difficulty extends to developing clear rationales linking EI and HWB, for example, linking the development of community forests with income, sense of place, health and education.

- A set of filters should be used to assess linkages between objectives and actions, for example:
  - the jurisdiction for making this decision, e.g., health, education, housing;
  - the people/agency with decision-making power;
  - the type of indicator (self–assessment vs. socio-demographic);
  - the geographic and time-scale of data collection, i.e. whose well-being is being assessed?

## ***Predictive models in social science***

- The large number of HWB indicators in the LUPs shows our lack of knowledge about predictive measures in social science.
- Modeling still provides a valuable way to structure our thinking around relationships and predicting outcomes.
- Since predictive models in the social sciences “tend to fail dismally”, we need to record the level of uncertainty involved and avoid the inappropriate use of quantitative measurements for aspects such as “community spirit”.
- Modeling difficulties could be reflected by graphing large areas of uncertainty around risk curves of the type Babine used.
- Build on work and lessons learned from other places. For example, mapping cultural zones did not work, so best not to do that again.

## ***Scope of monitoring projects***

- Our initial focus needs to be more fundamental: define and measure what the components of HWB are, rather than develop and test hypotheses on the effectiveness of different activities to improve it.
- Our focus has been primarily on the economic aspect of HWB and actions we can do on the land-base, for example, increase harvesting to boost employment and revenue. We need to explore other facets: cultural, sense of place, social systems/processes, education, and health.

- Currently, we do not have objectives for education and health, but these areas will play a role. Perhaps communities will be the mechanism integrating use of the land and HWB if their values include health, education, sense of place, etc.
- Education and health are in the jurisdiction of other departments and out of the LUPs' control.
- Local governments struggle with this: they have no control other than to build their communities. Job creation and increased population are the major ways to improve health and education: those ministries base all funding on jobs and populations. It all flows from the economic opportunities.
- The objectives for HWB are evolving. In the Babine watershed, the approach was to start with objectives in the land use plans and let them develop through monitoring.

## **Identifying strategies for Human Well-Being**

The lack of strategies related to HWB objectives in the LUPs led to a discussion on approaches for developing HWB strategies and indicators.

### ***Strengthen existing community activities and initiatives***

- Since the effects of HWB strategies are intertwined, rather than thinking of a discrete technical intervention, we should identify ways to build on and strengthen activities/initiatives communities are currently engaged in to improve their HWB. We need to help communities find ways to overcome obstacles and facilitate improvement.
- Our processes and actions need to address the issues of power and marginalization. Measuring how many children attend language class is easy, but does not address the fundamental problem with the education system. We need to examine links between land tenure, land use, and HWB. For example, with a community forest, there could be an incentive for education in the form of training. Land tenure and land use issues can also affect social cohesion.

### ***Developing and prioritizing HWB indicators***

- The LUPs have many indicators, which in some cases require further development. For example, there are indicators:
  - for monitoring HWB, but not connected to implementation of strategies,
  - associated with an assumed relationship/model (e.g., local ownership of tenures increases local HWB),
  - for strategies outside the jurisdiction of the plans but with influence on plan objectives.
- Developing qualitative indicators for HWB from citizens - as done by local governments - is better for capturing perspectives relevant to the community. However, this process can be very time consuming and grows in complexity with feedback loops with the community. It is important to build on existing work on indicators.
- Quantitative indicators are also useful for measuring HWB. For example, percentage of annual allowable cut held by communities can be measured and directly addresses local control and ownership, sense of place, and employment.

- A process to reduce and prioritize the many indicators needs to be established in communities, based on values and the principle of subsidiarity:
  - There is a positive relationship between proximity of decision-making to the community and its ability to reflect the values of the community;
  - Indicators and possibly strategies are going to differ according to the community and their particular values. However, objectives may be in common at a larger scale. Therefore, local, diverse indicators and strategies need to be nested within a broader framework.
- Possible criteria for prioritizing indicators include:
  - Areas in which our management actions can have a direct influence on an indicator and we can learn from, for example, “area harvested per year”, rather than “profit” which is affected by larger influences beyond our control, e.g., market cycles,
  - Indicators held in common, which may facilitate roll-up into broader scales,
  - Indicators tied to the land-base to provide linkage to LUPs,
  - Indicators tied to immediate actions that could improve HWB in the short term.
- It was suggested that the design of an HWB indicator selection process would create a fault line between aboriginal and non-aboriginal communities, since reinvigorating First Nations culture means decolonizing which runs contrary to the HWB of non-aboriginal cultures. In response, it was suggested that we need to identify what is common among the differences, and focus on creating a new relationship between aboriginal and non-aboriginal peoples.

## **Experimentation - EI and HWB perspectives**

Given the role of experimentation in conventional AM projects, participants shared a variety of opinions on how this approach might be viewed from EI and HWB perspectives.

- The EBM project is an experiment in land use planning, i.e. what decisions we make on the landmass and how that affects humans. Some decisions will affect the vitality of communities on the coast, but this project is not about experimenting with humans.
- Research on human subjects has already been dealt with in the medical community, and ethically appropriate approaches exist that can be used to experiment with humans.
- A major difference between human research and natural systems research is with the former, you can either develop a long-term relationship with the subjects through qualitative, robust, observational research, or you can have little engagement by using occasional surveys.
- We need to be very sensitive to how this initiative is perceived by the coastal communities: when we are referring to HWB. We do not want to use the term “experiment”.
- Economic and social policies are forms of experimenting with citizens, i.e. “experimentation” is already going on across the province.
- Communities will accept the need to learn to address areas of uncertainty.

## **Broad Management Learning Framework**

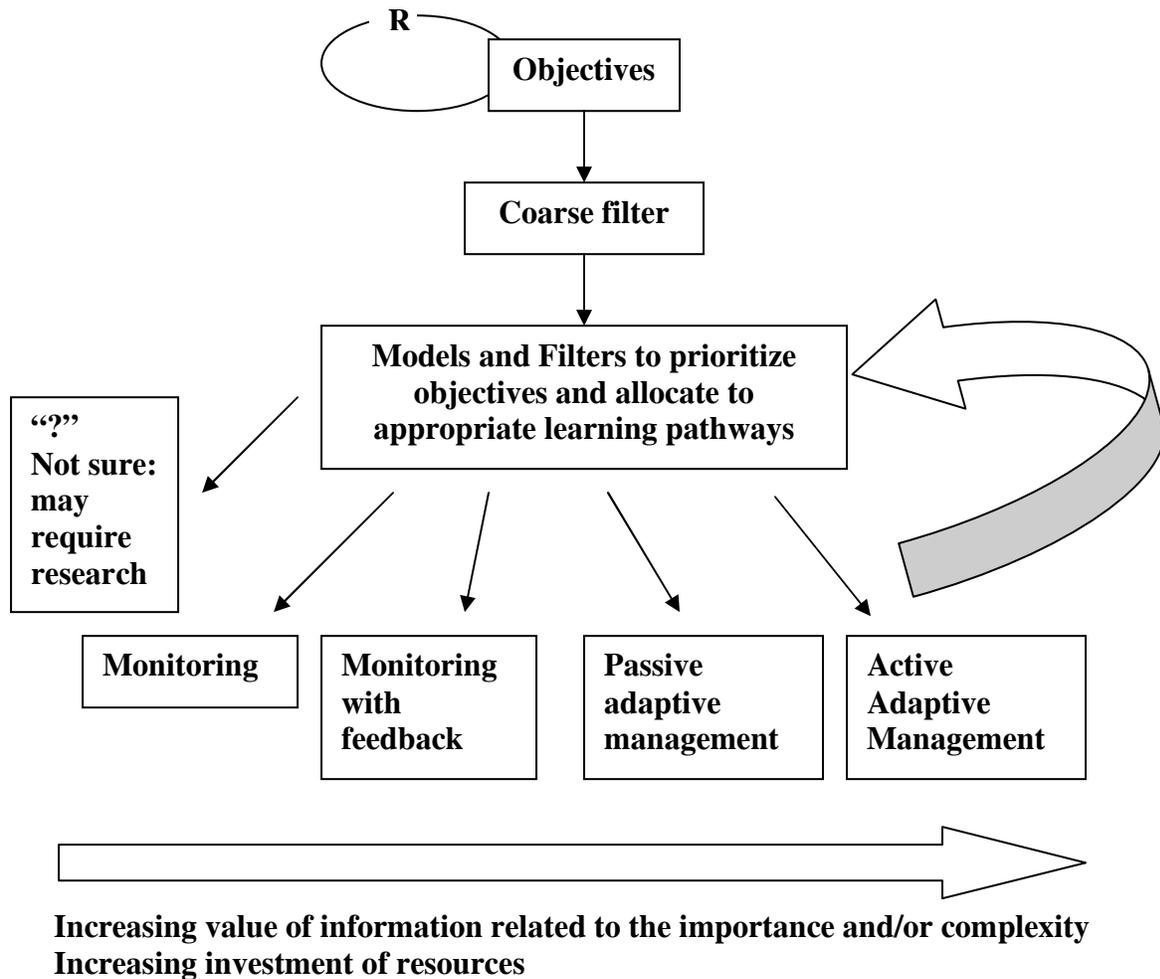
Participants agreed that, conventionally, AM has mostly been thought of as active AM, i.e. management conducted as an experiment (“an AM design”). However, to develop an AM framework for implementing EBM, we need to expand our focus to encompass any way rigorous, structured learning occurs that can improve management, from passive approaches to active. This includes methods different management systems use to enable and capture lessons learned.

Participants sketched out a broad “management learning framework” featuring different pathways to learning, depending on the objectives involved. In this framework, the conventional experimental (active) AM is but one method (Figure 2).

### ***Framework design***

- Since the word AM has long been associated with EBM implementation, we need to retain it but understand that it refers to a broad learning cycle that includes multiple ways of structured, rigorous learning including but not limited to experimentation.
- The framework must be based on structured learning, such as through comparison, and generate meaningful results.
- A filtering process is required to prioritize the monitoring of objectives.
- We need to clarify what decisions have already been made, and what is on the table.
- Use filters to categorize objectives according to the types of learning that would address what we need to know about how to achieve the objectives. Examples of what we would need to know include:
  - How well the implemented strategies achieve the objective;
  - What other strategies might be more effective;
  - If no strategies have been defined, what strategies could/should be considered;
  - How important the achievement of this objective is to the larger EBM goal of EI and/or HWB;
  - How this objective influences other objectives.
- Consider actions we foresee wanting to consider in the future. This will allow us to maximize the value from formal AM.
- Further elucidation of LUP objectives may be required to clarify their intent and make them of greater use, e.g., to provide clear direction for modeling, for formulating strategies to operationalize them in the field linked to an appropriate scale.
- Use existing objective statements as a starting point, since modifying objectives arrived at through consensus processes may be difficult.

**Figure 2: Broad Management Learning Framework**



**Steps in framework**

1. R = Refine objectives where necessary to clarify intent.
2. Start with a coarse filter before prioritizing, e.g. remove objectives not suited to adaptive management.
3. Use models to articulate the relationship between objectives, strategies and indicators. Use finer filters to determine which class (“pathway”) of learning is most suitable and which are of highest priority to work on. Filters could include:
  - Risk to objective;
  - Uncertainty in modelled relationship;
  - Resolvability of uncertainty;
  - Willingness to change management actions and existence of alternative actions;
  - Level of detail required to facilitate learning;
  - Sufficiency of existing knowledge (presence of data, research, resources);

- Influence on other objectives and goals;
- Ease (money required to implement and to learn);
- Scale, and possibility of roll-up and comparison across scales;
- Social aspects: stakeholder involvement in implementation of action and interpretation and use of results, possibility for extended learning;
- Applicability to land use planning;
- Applicability of/engagement with TEK.

There may be an iterative process between modeling and use of filters. For example, in the BMF, risk curve models identified risk and uncertainty, which were key filters for determining the type of learning pathway required (effectiveness, implementation, and validation monitoring) and initial priorities.

4. Assign objectives to appropriate learning pathways (represented by “learning bins”).
5. The monitoring results go back to the model – not the objectives, since revisiting these should only happen when needed.

### ***Features of the framework***

- “No objective left behind”: all LUP objectives can be assessed by this framework and for those which pass through the coarse filter, their learning requirement is determined.
- The box of filters is large and includes many assessment tools, for example, risk curves, learning requirements, and expert advice.
- The more formal the learning process, the more valuable the information, but the investment of resources also goes up. Complexity of monitoring correlates to cost of implementation.
- Feedback arrows go across the learning bins as well.

### Learning bins for EI

The learning bins identified in this framework are for objectives related to EI. Participants discussing this framework from an HWB perspective developed a second set of bins specifically for HWB (see below).

From left to right, learning bins are:

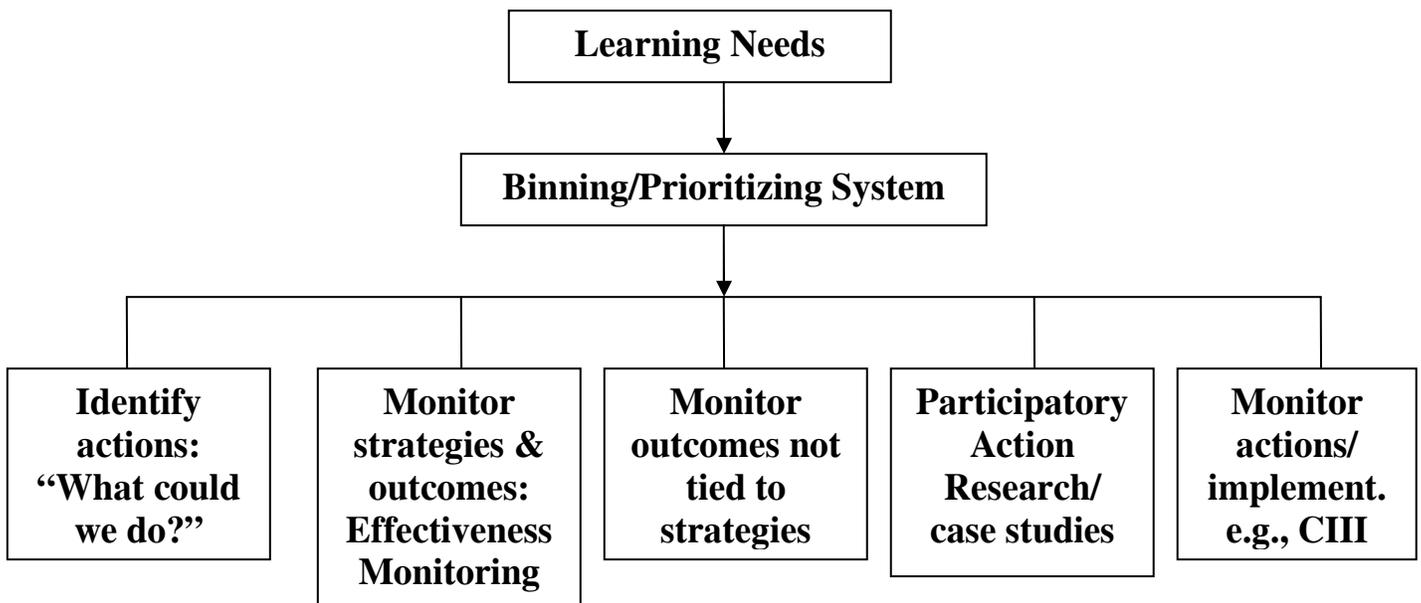
- “?”: research for very complex objectives, objectives with no strategies, or objectives for which our knowledge is very limited as to what we need to do next;
- Monitoring: for objectives we are uncertain about but which can be monitored due to low cost. Results will help us determine whether more rigorous study is required;
- Monitoring with feedback;
- Passive adaptive management: draw conclusions based on passive observations of impacts of management actions;
- Active adaptive management: employ formal experimental methods to test management actions.

### Learning bins for HWB

Participants identified the need to develop specific learning bins for HWB objectives. They are depicted in Figure 3, and described as follows (from left to right):

- Identify actions/strategies: for things that we don't know how to change, "what could we do?";
- Monitor strategies and outcomes: a strategy exists and is being monitored for effectiveness in reaching an objective, i.e. effectiveness monitoring;
- Monitor outcomes not tied to strategies: to track results of activities related to HWB over time, even though they are not tied to a strategy;
- Participatory Action Research/case studies: projects that will use a PAR approach. This bin is the equivalent to the "Active Adaptive Management" bin on the EI side;
- Monitor actions/implementation: actions not related to a land use agreement, but currently underway, for example, Conservation Incentives and Investment Initiative (CIII).

**Figure 3: Learning Bins for HWB Objectives**



## ***Aspects of the framework***

- A learning framework is perhaps more palatable in the HWB context, i.e. an emphasis on learning, rather than experimentation.
- Using existing LUP objectives may present challenges where they define means rather than ends and/or use a less than optimal scale.
- Be cautious with refining objectives and indicators: recognize the investment in developing these already made by the people involved in the process. Information from modeling, scientific literature and monitoring needs to inform discussions on these topics.
- All participants agreed that the AMF should structure and inform dialogue about effects of strategies, trade-offs among multiple objectives, etc., but it is not designed to resolve conflicts.
- The idea of “no objective left behind” is admirable, but HWB objectives would be left behind if the emphasis is always on land-based activities.
- Developing hypotheses and models needs input from both scientists and the local communities involved in the AM projects. This will ensure the process and results are useful and practical.
- Willingness to change is an important incentive to learn. We will need to determine the level of detail required to support people’s willingness to change, for example, results from experimental plots.
- Where experimentation is desired, we need to design treatments and allocate these strategically so that we are more likely to learn from them.
- By determining how learning happens throughout this process at various levels and rates, and for different objectives, we may be able to address objectives in different ways using different time tables.
- The framework includes Traditional Ecological Knowledge: different knowledge bases can be used to filter objectives and inform decision-making.
- The AMF needs to work for projects and AM learning plans beyond the LUPs. For example, if a forest licensee wants to apply a more ecologically risky version of a hydroriparian or grizzly bear LUO, an AM learning plan is required “to the extent practicable”. This will predetermine some priorities for monitoring objectives. We also need to look broadly: we need an explicit link between AM plans and the AMF to ensure the integration and use of results.

## ***Comparison with the Babine Monitoring Framework***

Participants acknowledged similarities and differences between the broad management learning framework and the BMF.

- Both frameworks rely on LUPs, expert input and literature to assess objectives on the first iteration, and include monitoring information for subsequent iterations.
- With the BMF, all objectives first go into the risk model (this was done because it was less controversial than “subjectively” prioritizing one objective over another). Conversely, with the above framework, an up-front coarse filter might carry out a preliminary ranking of objectives by identifying those requiring further evaluation using an AM approach. Choosing one objective over another is challenging, but drawing risk curves can be time consuming, depending on the level of detail and confidence required.

- Since the LUPs have many objectives, we may not want to spend time creating risk curves for objectives we agree not to pursue. However, rationales for not pursuing an objective would have to be clear.
- Risk curves in the BMF are used to sort objectives into learning bins by identifying which of the three kinds of monitoring is required.
- The learning bins in the two frameworks differ slightly:
  - “?” (insufficient information to monitor): same in both;
  - Monitoring: in the BMF, this would be a type of implementation monitoring (although in the BMF there would still be feedback to management);
  - Monitoring with feedback: in the BMF, a type of implementation or effectiveness monitoring;
  - Passive adaptive management: in the BMF, closest to effectiveness monitoring;
  - Active adaptive management: in the BMF, closest to validation monitoring.
- As you move from left to right across the learning bins, our framework provides increasing value of information and investment of resources. Similarly in the BMF, this movement provides increasing detail (for the risk curve), and requires higher costs.

### ***Designing the framework’s filters***

Participants recognized that designing the filters of the broad management learning framework could be an important part of the RFP, and thus, discussed this topic in greater depth.

- Involve communities and stakeholders in designing and using the filters. Filter criteria must make sense for the intended audience and applying the filters must be done in a very transparent fashion.
- Ask ourselves: “How does this criterion help us put the objective into a bin?”
- For EI, we need to know what people are prepared to change to help sort strategies. On the HWB side, we need to know what people are going to implement that would lead to learning, i.e. which HWB strategies being implemented do we wish to learn from.
- Develop a system for weighting criteria that is applicable in different areas to account for differences in objectives among communities, or explore whether differences among communities can be dealt with by identifying different community objectives, rather than different filter criteria.
- When using risk curves, check these at a few different scales to avoid developing curves limited in importance.
- The filtering process should identify high risk objectives where management action is beyond our land management strategies, i.e. in another jurisdiction like education. Establish another “bin” for these objectives, which need to be brought to the attention of an appropriate body, e.g., the LRFs. This can help catalyze action where we have sufficient research and political pressure is required.

### ***Testing the framework***

- The EBMWG has a project called “experimental watersheds” to identify potential watersheds where active AM experiments could be carried out. Some of these active AM experiments could start as early as spring 2008. Plans are to link this project to the AMF.

- Work with communities to identify where to undertake some initial research and studies.
- Find a community that is ready to test the AMF: they need to have been involved in the process.
- Ask the consultants to do that as part of the RFP.
- We need to ensure community involvement in how we make sense of the strategies and the criteria we use, rather than just rely on an expert group or else the solution will be contentious.
- Implementation of experimental watersheds should embody the principles of PAR, i.e. teach people about the AMF and let them test, modify and validate it. The project should be of importance to the community, not just about testing a framework.
- Since the development of the AMF is an iterative process, we need to think about what role experts will play and at what stage you need further input from users.
- Our language has to be understandable to engage communities in a meaningful way: eliminate jargon in our framework and communications by focusing on an issue of relevance for the community and use the steps in the AMF to ask questions.
- Our timeline will make meaningful engagement difficult to achieve.
- We can increase community engagement over time.

## **Effective structures and processes to feed monitoring information back to decision-makers and other relevant parties**

Participants examined institutional structures and methods to ensure monitoring information would be effectively fed back to decision-makers and other relevant parties.

### ***Existing institutional arrangement and gaps***

- The existing institutional arrangement has three key bodies:
  1. LRFs, which have joint First Nation and Provincial Government representatives, responsible for overseeing EBM implementation;
  2. EBMWG, which has a mandate to undertake research chosen by the LRF and make recommendations;
  3. PIMCs, which are the public bodies that engage stakeholders in monitoring the implementation of plans and making further recommendations.

Within this arrangement, there are three critical information processing and sharing gaps:

- A process to translate the results of research into information for decision-makers such as the LRFs, highlighting the implications for management actions and, more generally, our AM models;
- A parallel process to get the same information out to the people implementing actions on the ground so they can incorporate it.
- A process to get the information out to the communities. Project results will be relevant to them and often directly impact community members.

- An example of a project requiring strong information links with implementing actors and communities:

An objective in the G2G agreements is to increase local ownership of tenures, and commercial backcountry recreation tenures are a priority and have received substantial funding. Observational research can track the success of this initiative in achieving its objective, including an assessment of the criteria used to award tenures. Results could provide valuable recommendations, for example, to improve tenure approval criteria.

### ***A process for communicating management implications to decision-makers***

- There are three basic pathways to take in response to monitoring information:
  1. If the goals of the EBM are being met, then spread the good news.
  2. If the goals are not being met, then what changes are needed?
  3. If answer is unknown, then explore and clarify why we do not know. Identify what is being learned and who needs to do the learning.
- With the Forest Project at Weyerhaeuser, there was both an AM working group and a Variable Retention working group. Both of these groups were assessing how well strategies were meeting objectives. The findings they generated might have suggested some management change. If this happened, the groups would write up a draft policy indicating a desired direction to follow, and send it to management for approval. If the policy was approved, it went back out to operations.
- In our case, we require an organization or body that can translate the results of research into meaningful policy /extension recommendations. This body could be the EBMWG. It could:
  - write a policy recommendation and send it to the LRF or an appropriate decision-making body; or
  - translate information into a management option, and before this goes to decision-makers, the PIMC (or subgroup of the LRF) would review it to assess the implications to all the resource people involved (this differs from the current structure).
- Since there may be a diversity of opinions, this body could lay out a number of policy options.
- In the Babine, when it is discovered that a strategy will not meet an objective, the case is sent to the decision-making body (Community Resources Board). Here, potential consequences arising from changing a strategy are examined, for example, how a change in patch size may affect timber supply. The final policy decision is a value judgment, based on balancing multiple objectives. Key question is who produces the information on what the potential consequences are, including EI and HWB aspects.

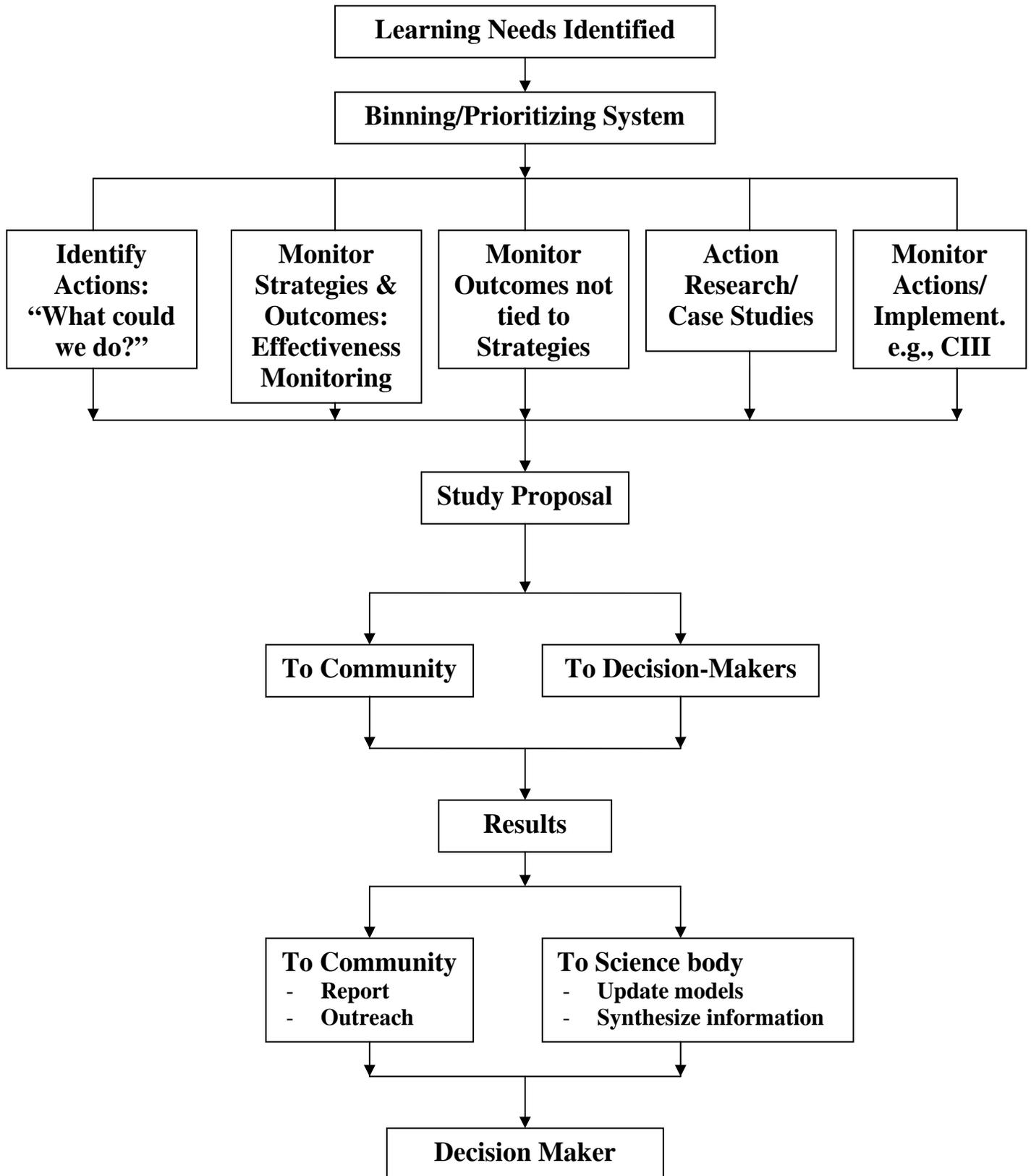
## ***Model to feedback monitoring results from HWB projects***

Participants developed a model to ensure the feedback of monitoring results from HWB projects to decision-makers and other relevant parties. The model starts with the placement of objectives into learning bins, and continues through to the presentation of results to decision-makers (Figure 4).

### Principles guiding the model

- Up-stream the information sharing process by getting information to relevant communities and decision-makers at the study design stage. For example, identify expected changes resulting from the research, such as how a decision-making process will incorporate findings from the project.
- Respect existing decision-making processes, especially when the results of research might make a significant difference to a particular strategy (e.g. bigger riparian buffers).
- Have an effective data management structure and process in place. Clarify by whom, for whom, accessible to whom.
- When planning for and sharing results with the communities involved,
  - budget and allocate resources wisely and find less expensive and/or unconventional ways to carry out extension/outreach, since sharing information with communities can be time consuming and expensive to do well;
  - provide information and results in an accessible manner and appropriate setting, e.g., a community gathering, readable formats, responsive to local needs, engaging presentations;
  - house the information locally, for example, by including in curriculum created with teachers.

**Figure 4: Model to Feedback Monitoring Results from HWB Projects**



### Steps in the model

- Sort objectives into appropriate learning bins and prioritize;
- Invite study proposals or PAR project proposals to monitor and examine priority objectives and associated strategies/indicators;
- Look at participatory issues and standards for the proposals;
- Vet a proposed study through communities and through decision-makers to ensure it makes sense and will be useful;
- Implement an approved study with appropriate community involvement;
- Feed results into two paths:
  1. Raw data to the communities with extension and outreach process to put it into context - since the community will be involved from the beginning, some of this extension will be happening all along,
  2. To a science group – currently the EBMWG – who then use this information to update the model and synthesize information into management implications;
- Send decision-makers (e.g., LRFs) information about the project's performance from the two groups:
  - The science group: did the project achieve desired results?
  - The community: how does the community feel about the project?

### Example of using the model

- Context: How to spend \$100 million.
- Goal: Increase HWB.
- Objective: Increase employment, sense of place, (could be others).
- Strategies:
  - Provide local ownership of tenures,
  - Invest in tourism.
- Design risk curves which capture how we think local tenures relate to employment, sense of place, etc, and how we think investment in tourism relates to these objectives (this process also generates testable hypotheses).
- Compare risk curves for a decision to implement.
- Implement the strategy/strategies using various methods and monitor. For example, implementation monitoring would provide us with the percentage of tenures transferred, or the amount of money invested in tourism. Effectiveness monitoring would assess how these activities have affected our objectives related to employment and sense of place.
- Feedback monitoring results to the community and a science body. The science body updates models and then synthesizes information into management implications.
- Information from the community and science body is sent to decision-makers.

### Observations on the model

- This process would need to be adapted for differences among communities.
- Testing this model will help us to determine if these institutional arrangements will be sufficient or adequate for engaging in social choice processes.

- The team putting a proposal together should include individuals who are involved, e.g., community members.

### ***Institutional model to feedback monitoring results***

A second model for ensuring the feedback of monitoring results to decision-makers and other relevant parties was constructed by the EI breakout group. The model focuses on information sharing at a broad institutional level (Figure 5).

This model links to the previous model (i.e. feedback of monitoring results from HWB projects) at the “Results” stage, i.e. where monitoring results are shared with the community and science body. This model expands on who receives and processes monitoring results before these are passed on to decision-makers.

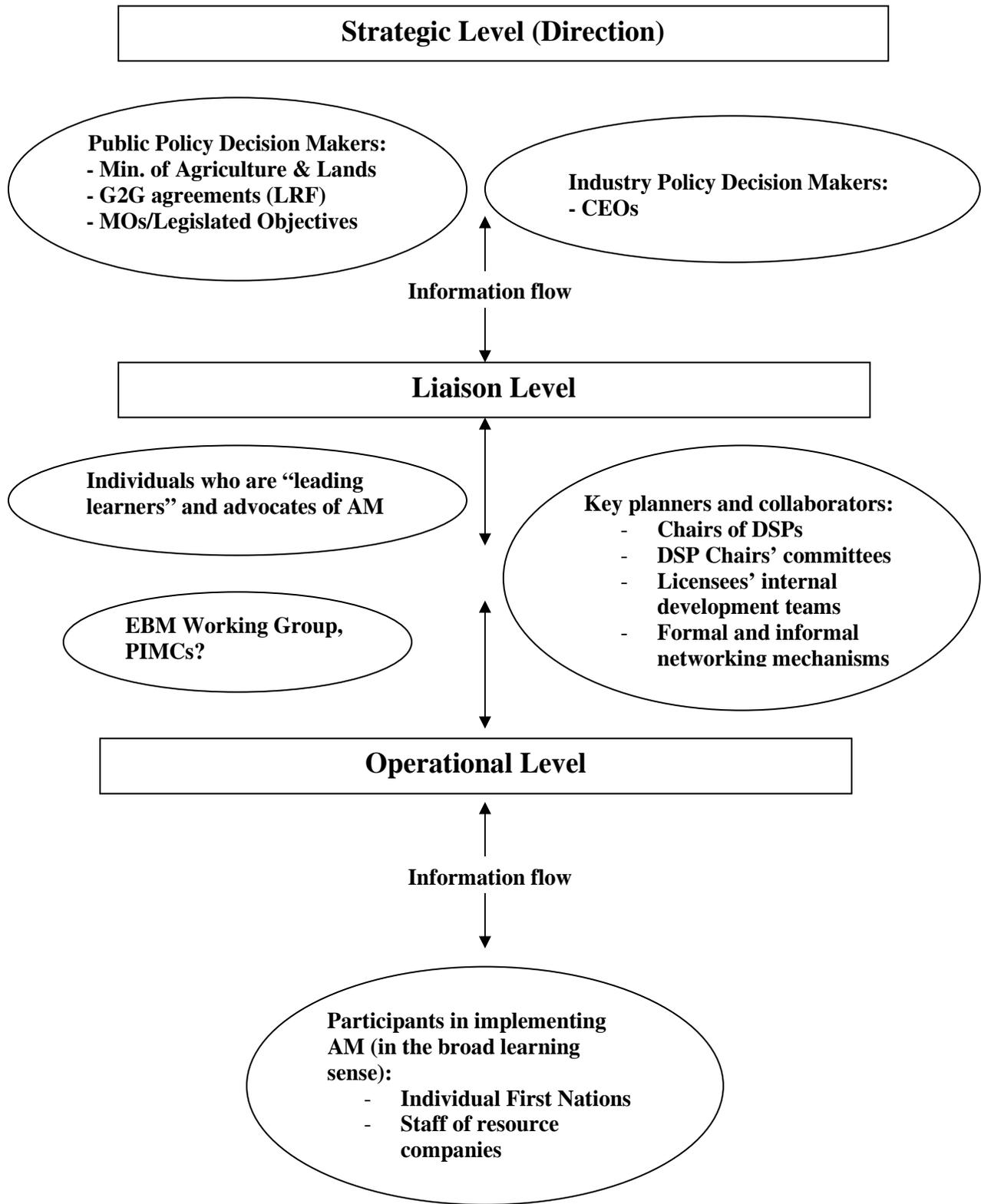
#### Principles guiding the model

- Ensure information sharing and flow is two-way, through all levels:
  - from operational level to strategic decision-making level,
  - from strategic decision-making to operational level.
- Identify key decision-makers, as well as:
  - what they need to know,
  - when they need to know,
  - how often they need the information.
- Link decision-makers with scale and scope of plans and operations.
- Build on and leverage existing networks and mechanisms.
- Identify people that can advocate AM learning, and if necessary, create a framework to cultivate them.
- Respect the ownership and intellectual capital invested in DSPs, FSPs, and other plans at smaller scales.

#### ***Principles in common with the previous model***

- Recognize authority and responsibility in decision-making processes, i.e. engage them in examining need for change, rather than by-passing them.
- Use a variety of institutional information sharing instruments and mechanisms to support a better decision-making process:
  - conventional information/educational formats, processes and products,
  - additional formats, processes and products, e.g., workshops, community meetings, web forums.
- Ensure mechanisms enable organizational and social capacity building at the local level engaging practitioners and addressing community needs.
- Ensure the learner is influenced through a variety of ways.

**Figure 5: Institutional Model to Feedback Monitoring Results**



## Description of the model

- There are three interconnected levels:
  1. Strategic level: provides direction. Key actors and sources of authority:
    - G2G agreements (LRFs), Minister of Agriculture and Lands, LUPs, Legislative Objectives, Industry CEOs;
  2. Liaison level: facilitates good information flow between Strategic and Operational levels. Examples of key actors:
    - Individuals who are leading learners, champions, advocates, key planners and collaborators, e.g. First Nations forestry advisors, members of the Coast Forest Conservation Initiative, people engaged in Sustainable Forest Management plans, members of the Coast Region Implementation Team,
    - Could include EBMWG and PIMCs;
  3. Operational level: implements projects at the local/community level. Examples of key actors:
    - Participants in implementation of EBM and AM, i.e. individual First Nations and industry company staff.
- The Strategic and Operational levels already exist: the Liaison level is more loose and needs to be formalized by identifying and formalizes roles.
- In the Liaison level, two information sharing mechanisms are identified:
  - Formal mechanisms, e.g., collaborative forums – meetings of DSP chairs and chairs' committees, annual FSP workshops.
  - Informal mechanisms, which evolve over time as relationships grow. Includes things like lunch meetings.
- On the operational level, implementation partners could also include the EBMWG, academic institutions, and government agencies.

## Observations

- We need to ensure information sharing mechanisms get the right information to the right people. For example,
  - they have to distinguish between an operational-level decision and a legal/policy-level decision;
  - they have to facilitate organizational learning.
- As projects become more complex, you involve an increasing number and diversity of actors (groups, organizations). You move from project teams, to internal community of practice, to external community of practice, to broader knowledge networks. This diversity of actors can provide needed technical expertise at the liaison level, be advocates for AM, and offer additional networks for sharing information/monitoring results.
- Develop this model by engaging people who specialize in policy learning and institutional design, e.g., Michael M'Gonigle, Murray Rutherford.

## **Engaging licensees in Adaptive Management projects**

Participants discussed how to involve licensees in AM projects. They agreed there are a lot of opportunities for exploration in this area.

### ***Engaging licensees***

- AM can be a carrot for licensees: it provides an opportunity to have flexibility with constraints as applied in the LUOs.
- Similar to communities, engaging licensees in investigating and addressing their areas of interest and concern will get their participation.
- FSPs should be linked to the guidance that comes out of the EBMWG about adaptive management.
- Shared priorities from AM could create economies of scale to collaborate, e.g., sharing information.
- Common standards or approaches would be useful for data collection for AM projects. AM plans developed for FSPs may at some time be rolled-up into a regional plan.
- We need to find ways to engage licensees on HWB issues. An example with non-timber forest products: a forest company could test methods to improve mushroom production through stand manipulation. This has the potential to benefit both local people and the company.

### ***Funding forestry-related AM projects***

- The FIA could evaluate proposals using criteria based on the AMF and projects identified by the EBMWG. This would enable both control over the quality of operations receiving funding, and flexibility in implementation.
- This would make funds available to First Nations and forest licensees to support AM within their DSPs and FSPs.
- The development of the AMF could provide products that FIA and other funders could take on board that would allow for standardization of AM projects (e.g., templates). This would ensure rigour and consistency, and enable data roll-up.

## **Building local capacity and institutions**

Participants discussed ways an AMF could support capacity building at the local level, including the development of local institutions to manage land and resources.

### ***Building local capacity throughout AM cycle***

- A principle for research design and implementation: build local capacity so residents can take control and carry the initiative/project forward.
- In the short-term, some projects will be driven by the EBMWG, but over time, devolve control so they are more community-driven.
- Ranking of objectives can be part of building capacity.

- The process of carrying out PAR has been more important for the community for enabling transformative change than the analytical results from implementing the projects.
- Successfully engaging communities and building local capacity is a way to link the EI and HWB sides: engaging in research on ecological issues could increase the well-being of the people involved. For example, engaging a community in formulating EI objectives or strategies that incorporate local values can increase “sense of place” among community members.

### ***Developing local institutions***

- We could benefit by establishing smaller, localized AM committees that could work with communities within the broader institutional setting. These committees could:
  - have community members on it;
  - oversee AM activities;
  - have the authority to make recommendations;
  - ideally, if local communities own local plans, have decision-making authority to make adjustments.
- In the Babine example, the people that wanted to establish a monitoring program participated in the design of a local governance structure, establishing the Babine Watershed Monitoring Trust. The Trust determines what research projects to fund, how to use research findings and how information is communicated. A formal document lays out how the Trust is to handle cases where adjustments are required, for example, to management actions or objectives. In these cases, the Trust prepares the information and sends it to the Community Resource Board which has the responsibility and authority to make changes.
- The Babine institutional model works well for small scale projects, 0.5 M ha. However, the area of the North and Central Coast is vast in comparison and has additional layers of complexity.
- In Clayoquot Sound, there are Technical Planning Committees, composed of government and First Nations with decision-making authority at the watershed level. They have a mandate to design and implement plans, monitor results, and make necessary adjustments to management actions.
- Successful PAR projects ended up with the devolution of responsibility to local jurisdictions, and more secure collective tenure. There may be parallels with the situation on the North and Central Coast.
- One approach we could explore would be to identify existing groups at the appropriate scale which could make recommendations on what moves forward, for example, Timber Supply Area Steering Committees.
- A key challenge with developing local institutions is establishing and maintaining simple mechanisms for information flow among operations and throughout the region. The institutions we already have are becoming unwieldy.

## **Traditional Ecological Knowledge and Adaptive Management**

Various aspects to engaging First Nations Traditional Ecological Knowledge (TEK) in an AM process were explored during the workshop.

### ***TEK as a knowledge system***

- TEK is a process and a knowledge system: context for the information and the use of the knowledge are important aspects. However, integration of TEK is frequently done as a data mining exercise, i.e. a set of facts to be extracted and plugged into scientific models to inform, refine or correct them. This extraction from context and application to other problems constitutes a misuse of the knowledge.
- TEK tends to be holistic, e.g., the “feel of the river” as a qualitative indicator of the river, not just focused on fish biomass.

### ***Developing methods and protocols***

- At the practitioner level, you need to get beyond just giving nods to the three principles of respect, reciprocity and retribution and engage with the people who are actually doing the work in the community. We need to do community-based participatory action research.
- TEK has to be part of the decision-making framework driven by traditional values.
- “Upstream” TEK, i.e. engage TEK practitioners and experts early to structure the problem and define how it will be addressed and evaluated (objectives, strategies and indicators).
- We could have a TEK filter in our AMF: Applicability of/engagement with TEK.
- Researchers often need to go beyond the community leaders to find actual local knowledge holders. Inform political leadership, but seek out the actual local experts.
- We need effective methods and protocols for creating and using good qualitative indicators.
- Given TEK is very place-based and community-based, how we deal with aspects of AM that are not place-based and reflect this in the framework? How do we roll-up TEK?
- Develop methods and protocols to ensure TEK is used in appropriate ways beyond the local level.
- A broad protocol around collaboration is needed, including communications and access to information and its use.
- The PAR approach needs to be used: it can address the ownership and power issues involved.
- Ensure projects have direct local benefits for communities – the Long Beach Model Forest had a policy that all projects had to include First Nations.
- We agree that participatory approaches are required to engage TEK process properly. Need to have presence within the community.
- There are good existing models to look at, e.g., Ungulate Winter Range (UWR) initiative on the Central Coast, which has been five years in the making.

## **Roles and responsibilities for the EBMWG**

Alex Grzybowski, Director of the EBMWG, clarified for participants that at this point in time, the EBMWG is placing a priority on implementing projects rather than increasing the participation of involved parties. The EBMWG has developed an EBM framework for implementation, and is hoping to start-up the “experimental watersheds” project in spring, 2008.

Participants generated and generally supported the following ideas for possible roles and responsibilities the EBMWG could carry out to further support the AM initiative:

- Start by reporting out on a set of core indicators – identified by the consultants developing the AMF – to gauge success. This set can be iteratively improved over time, increasing the quality of community involvement. This recognizes that the EBMWG has to function at two levels:
  1. Locally, by engaging communities;
  2. Broadly, by being accountable to society.

Our monitoring and reporting framework needs to capture both.

- Select projects to work on once the objectives, strategies and indicators are sorted into learning bins by the consultant team developing the AMF. Selection criteria should be based on EBMWG priorities, e.g., cost.
- Develop and communicate realistic expectations of your work, including scope.
- Manage, maintain and update the AMF based on results emerging from management actions.
- Develop an effective way to translate monitoring results into implications for management and send this information to the LRF, including recommendations – it is within the EBMWG mandate and the LRF has asked for these.
- Identify an organization to keep the AM information currently being generated, or take on this responsibility.
- Provide guidance to communities and stakeholders throughout the stages of the AMF, e.g., designing and assessing study proposals, etc.

## **Future institutional support for adaptive management**

Given the long-term nature of the AM initiative, participants agreed that ongoing institutional support was critical, and could be provided by a central body such as the EBMWG or a combination of groups.

### ***Purpose and potential roles of a central body***

- The overall purpose of a central body would be to facilitate the formation and continued operation of an EBM and AM community of practice. Specific roles could include:
  - Coordinating AM activities and information by, for example, acting as a “clearing house”;
  - Sponsoring annual events to showcase learning tools and successes;
  - Providing training and coaching on how to do EBM and AM;
  - Providing support to groups/communities to develop proposals and acquire funding;
  - Encouraging collaboration and leveraging partnerships, for example, with First Nations land use practitioners through the EBM Learning Forum;

- Creating standards for project deliverables, which would also guide funding to achieve effective AM (e.g., for FIA);
  - Issuing RFPs;
  - Monitoring and reporting out on progress to date with implementing EBM;
  - Data management.
- The central body could have research facilitation staff to support local community AM initiatives and capacity building.
  - This body needs to improve on and connect with existing related processes in the North and Central Coast. For example, link with First Nations land use practitioners through the EBM Learning Forum initiative.

### ***Potential models***

- Review existing models to identify possible structures, services and methods of funding with relevance to the North and Central Coast, including:
  - Bulkley Valley Centre for Natural Resources Research and Management: a not-for-profit society based in Smithers, conducting interdisciplinary research on the environment, including human dimensions. It acts as an umbrella organization for managers and researchers to collaborate and coordinate AM activities in area, writes proposals, sets standards, carries out data management, and has core staff to carry out these responsibilities
  - Saskatchewan Forestry Centre
  - Fraser Basin Council
  - Columbia Mountains Institute
  - FORREX
  - Columbia Basin Trust.

### ***Sources of funding***

- Possible source of funding for this central body include:
  - Coast Opportunities Fund
  - Western Economic Diversification
  - First Nations Forestry Council
  - Social Sciences and Humanities Research Council.
- Models based on trusts have best track record: we need to build a business case to establish a trust.

## **Sources of standards for guidance on monitoring and experiments**

Following are various opinions and suggestions generated by participants on the topic of identifying sources of standards to guide monitoring and AM experiments.

### ***Predetermining standards***

- Do not create a bunch of standards ahead of time. Identify the topics you want information on, and leave it up to the people implementing the projects to use well-accepted standards. Do this at the proposal stage.
- There is an opportunity with this AM initiative to establish a system with standards before multiple projects get going. This would enable scaling up to occur in a coordinated and comparable fashion.

### ***Research protocols for HWB projects***

- PAR has well-established research protocols in some areas, e.g., the Canadian Institutes of Health Research has guidelines for protocols with communities.
- Some protocols exist with First Nations regarding health issues.
- RFP could suggest that contractors need to identify factors that need to be considered when designing an HWB research or monitoring program. For example, for self-assessment surveys, you need to consider x, y and z. However, this could preclude qualitative research.

### ***Peer review***

- Have an independent autonomous peer review process at the study proposal stage. Recognize the need for credible research, practical implementation and local community learning.
- Include an extended peer review process to ensure involvement of people who will be implementing projects/studies. This will help to ensure the projects are designed both with quality and will be helpful to the communities involved.
- Use peer review to assess results, using existing protocols as far as possible.

### ***FIA and AM standards***

- One of the outputs of the AMF development could be products that FIA could take on board that would allow for standardization of AM projects. This would ensure rigour and consistency and allow information to be rolled-up.
- Participatory approaches deliver HWB outcomes, so it would fit into this type of template. Provide guidance/template on how to carry out participation and deliver consistent results.
- This would enable local AM teams to move forward.

### ***Sources of standards***

- Resources Inventory Committee.
- Nature Conservancy of Canada: standards for effectiveness monitoring – Ian Giesbrecht, Simon Fraser University (SFU).

- Land Management Handbook 42: statistical methods for adaptive management studies; Bruce M. Chapter 9, Publication of Research Branch.
- Carl Swartz, SFU Department of Statistics.
- Parks Canada and Environment Canada: ecological integrity, ecological restoration, etc.
- Lee Failing: paper on 10 common mistakes in designing biodiversity indicators for policy.
- Randal Peterman, SFU: AM and fisheries.
- Walters and Peterman: workshops on decision analysis and statistics; trend analysis;
- Pacific Institute of Mathematic Sciences: they may want to provide analytical advice.
- Environmental Monitoring and Assessment Program's Master Sampling Approach (US Environmental Protection Agency): a model for rolling up of monitoring data from different scales.
- A 10-year review of a generally unsuccessful large adaptive management project – the Forest Ecosystem Management Assessment Team (FEMAT):
  - Gray, A. N. 2000. Adaptive ecosystem management in the Pacific Northwest: a case study from coastal Oregon. *Conservation Ecology* 4(2): 6.
  - <http://www.consecol.org/vol4/iss2/art6/>

## 4 Key themes, Issues and Discussion Points from Invited Guests

At the end of both days of the workshop, implementation partners and EBM/AM practitioners were invited to attend. They heard a summary of results of workshop discussions to date, and engaged in questions and answers with workshop participants. Following are key themes and issues covered, and main points of discussion. Responses to questions posed do not necessarily represent the view of the majority of expert participants.

### Funding the AMF and AM projects

#### Question

- PIMC is looking for something more practical, more common sense that will actually work on the ground. This looks like an academic exercise. It seems that you are building a Cadillac with tinted windows but nothing inside. A business plan needs to be developed for how the implementation of this framework and projects will be funded. What are the costs associated with this?

#### Responses

- This is not a Cadillac – you can turn this model into whatever version of car you want, something more or less expensive. For example, we can harness the large amount of money currently being spent by organizing existing initiatives within the AMF so the information they generate will more effectively contribute to management decisions in the future. We can do this without putting more money into the system, e.g., the bicycle version. If more action is required, we can explore options for financing.
- In the Babine, the cost was approximately \$40,000 for 40,000 hectares (\$1/ha). The upfront work and complexity has been very important to ensure the work on the ground has real meaning and has moved us in the right direction. There were ad hoc monitoring projects for the last 50 years whose results kept disappearing: things were not working. A group of stakeholders decided what would work best for them. The community took ownership of the projects. This process also allowed the community to get involved in a meaningful way. It may be difficult to see from our models the practical application, but Babine is an example that worked. So it is doable and not too expensive on that scale.
- The AMF will help us separate out those projects that need expensive treatments from others – probably the majority – that do not. The framework allows us to identify projects with a range of costs. But this will still need some funding.

#### Question

- Will funding rest mostly on forestry?

#### Responses

- Fees can be matched by industry and government to cover the costs.
- Asking for fees from industry may not be realistic.
- In the Babine, money comes from a variety of sources.

It was agreed the RFP should identify sources of funding.

## Ensuring structured learning

### Question

- We need to capture learning in a structured way. So where is the structured learning? What is the nature of the structure?

### Responses

- If, for example, we want to deliver HWB outcomes by developing a bunch of community forests, we would have to determine the rationale for this relationship. It would be analogous to a model or hypothesis. You can determine some indicators of implementation and effectiveness, monitor them, and then determine if that strategy worked. The problem is different on the ecological side: how do you organize your options? On the HWB side, there's a dearth of strategies. We don't even have something to monitor. We don't have lots of things we want to do to affect HWB. But we do have actions being implemented on the coast that are relevant to HWB – e.g. CIII. How does the AM framework ensure that we learn from this investment?
- On ecological side, you need to know what are people prepared to change. On the HWB side, you need to know what is it that people are going to implement that they want to learn from, i.e. which HWB strategies are a priority to learn from. You set up the AM so you learn from that exercise.

## HWB project scope

### Question

- How did you get at the problem of linking objectives to practices and impacts? How did you deal with getting a focus on what we are actually going to do?

### Responses

- We identified some filters, for example, what is the jurisdiction for making this decision? Where does the power lie to effect change? We need to clearly understand the assumptions and the rationale. We also have to acknowledge what type of indicator we are addressing (self-assessment vs. socio-demographic) and on what scale we are doing data collection.
- On the HWB side, there are very few strategies for trying to achieve objectives. Effects are all intertwined. The task is how to build on positives using social processes rather than to think of discrete technical interventions.
- (Guest): But that opens up the whole social policy realm – you can deal with HWB and completely separate that from what you do on the land, for example, make sure X% of revenue goes to community and not change forest practices at all.
- No, we want to tie it back to the land-base. What you want to do on the land has effects on social cohesiveness and divisiveness and health and education because they provide incentives. The LUP process is not going to affect how much money is available, but you can create incentives for education. For example, setting up a community forest generates incentives for education.
- We need to understand HWB in the broader context. We would need to know what's going on with e.g. education even though we might not have a strategy related to education.
- Don't lose focus on the actions and alternatives you have to consider.

- If we are looking for effective real time solutions, we need to be pragmatic and realistic, e.g., poverty eradication or educational success is not going to be done through a land management plan. We need to make sure that the strategies we choose and the indicators we use are somewhat focused on the land management plan.

#### Question

- Which human beings are you concerned about? Are you concerned about the people who live there now or the hoards of people who will move in to take advantage?

#### Response

- (From same guest): You can't push people around except with incentives. You can't get people to move without jobs. You have some things to work with: timber, fish, scenery. Whatever you do with them, you are going to attract people to the area if it's good or pay people to go there if it's not so good. So the human being side of things is hard to manage.

### **Scope and process for testing HWB “predictions”**

#### Question

- The Central Coast LRMP came up with a vision statement which was pretty well all qualitative: improved HWB. Everyone is expecting HWB to improve. Presumably, someone is going to measure HWB – perhaps EBMWG will tell us how to do this – and there will be a base case so we know if we are improving. Predictions will be made based on management decisions you make. It would be unfortunate if we made decisions and HWB actually went down. Will the EBMWG makes these predictions? Who else?

#### Responses

- Part of the EBMWG workplan is to measure HWB and establish a baseline. This work is funded and going on. Predictions are made, but not exactly in the way you framed it. For example, local ownership of tenures exists within the current framework for HWB. This implies increased local ownership leads to improved HWB. We need to test this assumption to see if local ownership of tenures actually improves HWB.
- (Guest): It would be useful to study how to avoid failures of new business start-ups. This might be something that the EBMWG could look at to provide guidance.
- There are many HWB actions going on that need to be monitored to identify which are effective, e.g., those funded by the CIII. At least the EBMWG, within the framework, can provide the opportunity to explicitly learn from the implementation of these actions. As they progress, we can learn how to avoid failures. Hopefully, the Board for CIII has criteria for assessing projects based on reducing the likelihood of failure.

### **Legal status of AM and relationship with social choice**

#### Question

- Is government considering AM to be public policy or have the weight of law behind it?

#### Response

- The government's intent is to capture AM in a legal objective.

### Question

- How do you capture social choice in a legal objective?

### Response

- The intent is to capture the idea of support for AM as part of the process for choosing, not the actual social choice. The intent of AM is to generate information to affect social choice.

### Question

- How will existing agreements be incorporated into legal objectives? For example, how will Prince Rupert's Memorandum of Agreement for no net job loss be balanced with management decisions made by AM?

### Responses

- There are some expectations that the AMF is the mechanism for making social choices. That is not the assumption in this room. The AMF will provide decision-makers with a range of possible options on social choices. It will not make those choices.
- There is a distinction between the AMF and decision-support analysis: the AMF's learning approach feeds monitoring results into management decision-making but does not determine how you make the management decision.
- To the extent that we can provide the same information with the same kind of rigour and structure will help to make sure that the information provided is treated with equal importance by the decision-making groups.
- We saw the need for some sort of body or group to translate monitoring results into management implications for decision-makers. We have two bodies right now – the EBMWG and PIMC. We are not sure if they are sufficient or adequate to engage in the social choice processes.

## **Double-blind peer review**

### Question

- What about double-blind peer review?

### Response

- The process could be used where appropriate: it will be project specific.
- I encourage you to ask for extended peer review. Peer review is not just to be an academic exercise. Ensure that the projects are designed to be helpful to the community. Get it out to the people who will be using it before the project gets funded. Encourage communities to ask for, and expect, appropriate peer review, both from the usefulness of the research, and the quality.

## 5 Next Steps

At the close of the workshop, Alex Grzybowski outlined next steps to be pursued by the EBMWG in developing and testing the AMF. These include:

- The production of a summary report of the workshop;
- The design a Terms of Reference for an RFP for the development of the AMF;
- The distribution of the RFP:
  - Consideration is being given to completing the RFP first, choosing the consulting team, and then having a second implementation partners' workshop as part of the development of the AMF. The implementation and development of the AMF has to be collaborative for it to be successful, and this process needs to engage implementation partners appropriately all the way through;
- The selection of the successful RFP candidate in early 2008. Ideally, a consulting team submitting a proposal would have all the elements present in this workshop – local level representation, people with experience in AM, etc;
- The development of the AMF, ideally, by mid-January and finished by June;
- The initiation of projects on the ground, ideally, by April (the “experimental watersheds” project).

## 6 Recommended Requirements for a Terms of Reference to Develop the Adaptive Management Framework

One of the workshop's objectives was to identify key requirements of a Terms of Reference for the generation of an AMF for BC's North and Central Coast. Following is a list of requirements recommended by participants during the workshop to be included in an RFP for the development of the AMF. The list is organized by main topics.

A diagram synthesizing participants' ideas on potential steps in an AMF for use in the RFP is presented at the end of this section.

### General recommendations

- Keep the AMF as generalized as possible to allow implementing partners (e.g., professional foresters) room for adaptation to the situational specifics on site.
- Include the agreed upon definition of AM as per the G2G agreements.
- Ensure the process of TEK is engaged in all steps of the AMF.
- Develop an inventory of potential HWB actions and strategies.

### Develop models, filters and learning bins

- Define and develop the models, filters and learning bins for prioritizing objectives and allocating them to learning pathways (see Figure 6 for possible steps in an AMF). Build on suggestions from workshop:
  - Coarse filter: are there objectives or management actions that should not be studied through AM?
  - Finer filters:
    - Risk to objective;
    - Uncertainty in model (and therefore, risk);
    - Resolvability of uncertainty;
    - Willingness to change management actions and existence of alternative actions;
    - Level of detail required to facilitate learning;
    - Sufficiency of existing knowledge (presence of data, research, resources);
    - Influence on other objectives and goals;
    - Ease (money required to implement and to learn);
    - Scale, and possibility of roll-up and comparison across scales;
    - Social aspects: stakeholder involvement in implementation of action and interpretation and use of results, possibility for extended learning;
    - Applicability to land use planning;
    - Applicability of/engagement with TEK.

Specifically for HWB:

- Management actions which can have a direct influence and provide learning;
- Potential to improve HWB in the short term.

- Define the relationship among the filters and models. A model may be a key type of filter, e.g., risk curves.
- Develop a flexible method for creating and weighting criteria to assist communities in prioritizing HWB objectives according to their needs/preferences. Provide guidance to communities in applying such a method.
- Recommend the types of research applicable for each of the learning bins.

## **Modeling/hypothesizing relationships**

For HWB:

- Develop filters to assess linkages between objectives and actions, for example:
  - the jurisdiction for making this decision, e.g., health, education, housing;
  - the people/agency with decision-making power;
  - the type of indicator (self–assessment vs. socio-demographic);
  - the geographic and time-scale of data collection, i.e. whose well-being is being assessed?

For EI and HWB:

- Develop models of the relationships between objectives and strategies/indicators that are as simple as possible, but provide a hypothesis to test, e.g., concept maps, risk curves. Some indicators will require refinement and the intent of some objectives will be clarified in this process.

## **Prioritize objectives and identify learning pathways**

- Prioritize objectives and categorize them according to learning pathways using the models and filters developed.
- Identify a core set of indicators with which the EMBWG can gauge and report the success of the AM initiative.
- Identify what may be necessary to support experimental, monitoring and learning platforms, e.g., paired watersheds and other uses of land, long term experimentation.
- Identify how implementation and effectiveness monitoring projects can be linked, e.g., lining a monitoring project to determine whether trees in riparian buffers remain standing post-harvest (implementation monitoring) with a project to determine how standing trees are contributing to a functioning riparian ecosystem (effectiveness monitoring).

## **Community and stakeholder involvement**

- Further test and develop the AMF design by:
  - identifying willing communities,
  - building a project team that involves community members and key stakeholders,
  - designing and testing a process to effectively engage the communities and stakeholders in selecting and implementing AM projects, ensuring key users of the monitoring information invest in project implementation and results,
  - nesting local, diverse indicators and strategies within a broader framework of common objectives.

## **Effective feedback of monitoring results to decision-makers and other relevant parties**

- Design a model for institutional and community learning from AM monitoring results that builds on concepts developed by workshop participants, including
  - learning across strategic, liaison and operational levels,
  - processes to engage communities and decision-makers throughout project life.
- Identify existing advocates of AM in organizations, professions, etc, and ways to cultivate more.

## **Funding**

- Explore a link with the FIA to fund AM projects that would allow for standardization and comparability across scales.
- Identify other potential sources of funding for projects implementing the AMF.

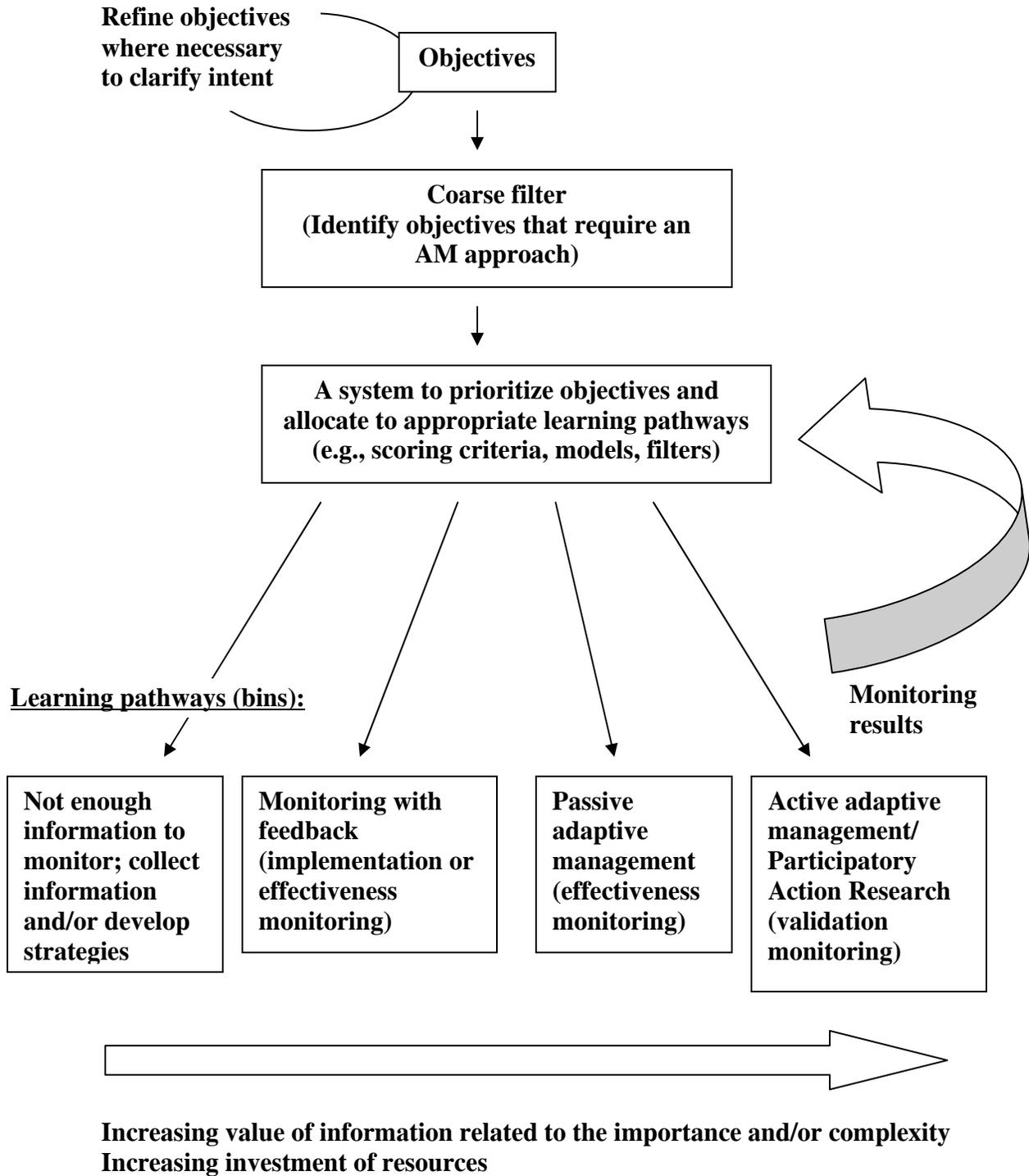
## **Identify standards for AM projects**

- Recommend possible standards for the types of research applicable for each of the learning bins.
- Develop products (e.g., best practices and tools) for participatory/collaborative learning processes with communities and stakeholders.
- Develop products that FIA and other funders could use in their selection process that would facilitate standardization of AM projects (e.g., templates) to ensure rigour, consistency and data roll-up.

## **Potential steps in an AMF**

Following is a diagram synthesizing the ideas of workshop participants on potential steps in an AMF (Figure 6).

**Figure 6: Synthesis of potential steps in an Adaptive Management Framework**



## 7 Appendices

### Appendix A: Workshop Agenda

Ecosystem-Based Management Working Group

*Expert and Practitioner Workshop: November 1 & 2, 2007*

*Garibaldi Room, Blue Horizon Hotel, Vancouver*

### Agenda

#### GOAL

To build on existing models of Adaptive Management, as represented by the collective experience of working session participants, to provide recommendations on the design of an Adaptive Management framework (AMF) for the implementation of Ecosystem-based Management (EBM) in BC's North and Central Coast.

#### OBJECTIVES

The objectives of the workshop are:

- To build a common understanding of the role of Adaptive Management in BC's North and Central Coast land use planning and agreements;
- To identify key scientific and implementation issues in designing an AMF and the implications of their interactions;
- To identify sources of information to draw upon in designing an AMF;
- To identify key requirements of a Terms of Reference for the generation of an AMF for BC's North and Central Coast.

# November 1

- 8:30 Breakfast and registration
- 9:00 Welcome – Alex Grzybowski, Chair, EBM Working Group  
Introductions and agenda review – Facilitator Peter Abrams, Dovetail Consulting
- Objective 1** ***Build a common understanding of the role of AM in BC’s North and Central Coast land use planning and agreements***
- 9:20 Context and scope for the AMF: presentations and discussion  
**The role of the Adaptive Management Framework in coastal land use planning and agreements** – Alex Grzybowski, Chair, EBM Working Group  
**Summary of LUPs** – Dave Daust, Consultant
- 10:30 *Break*
- Objective 2** ***To identify key scientific and implementation issues***
- 10:45 The adaptive management cycle and its application: presentations and discussion  
**An Adaptive Management Cycle** – Lee Failing, Partner, Compass Resource Management  
**Babine Watershed Monitoring Framework: An application of the AM Cycle** – Karen Price, Consultant
- 12:30pm *Lunch*
- Objective 2** ***To identify key scientific and implementation design issues***
- Objective 3** ***To identify sources of information to draw upon in designing AMF***
- Objective 4** ***To identify key requirements for a TOR to generate the AMF***
- 1:15 Identify key issues in and resources for designing the stages of an AMF for BC’s North and Central Coast – Breakout groups
- 3:00 *Break*
- 3:20 Presentation of experts’/practitioners’ results to date  
Open discussion with invited technical practitioners and implementation partners
- 4:45 Wrap-up
- 5:00 Close

## November 2

- 8:00 Breakfast
- 8:30 Check-in and summary to date
- Objective 2** *Identify key scientific and implementation design issues*
- 8:45 Developing the filters in the Learning Framework
- 10:30 *Break*
- 10:45 Adaptive Management: The Local Connection – Stephen Tyler
- Objective 2** *Identify key scientific and implementation design issues*
- Objective 3** *To identify sources of information to draw upon in designing AMF*
- Objective 4** *To identify key requirements for a TOR to generate the AMF*
- 11:30 Identify key issues in and resources for designing the stages of an AMF for BC's North and Central Coast – Breakout groups
- 12:45 *Lunch*
- 1:30 Identify key issues in and resources for designing the stages of an AMF for BC's North and Central Coast – Breakout groups
- 3:15 *Break*
- 3:30 Presentation of experts'/practitioners' results to date  
Open discussion with invited technical practitioners and implementation partners
- 4:30 Next steps
- 4:45 Close

## Appendix B: Workshop Participant List and Contact Information

<b>Name</b>	<b>Affiliation</b>	<b>email</b>
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## Appendix C: Glossary of Terms Used

**Adaptive Management:** a systematic approach for improving resource management by learning from management outcomes. It involves:

- exploring alternative ways to meet management objectives;
- predicting the outcomes of alternatives based on the current state of knowledge;
- implementing one or more of these alternatives;
- monitoring to learn about the impacts;
- using results to update knowledge and adjust management actions.

*US Dept of Interior, 2007. U.S. National Research Council*

Adaptive Management can be used in two forms:

- Passive AM involves Implementing an action, monitoring the response, and modifying actions;
- Active AM defines several possible actions, implements them, compares them, and chooses one. Timeline tends to be longer than passive AM, as well as the rigour involved with project steps.

**Effectiveness indicator:** metric linked closely to an objective; useful for assessing change in objective condition. Answers the question: Did our management action work? Did we get the outcome we wanted/achieve our objective?

**Goal:** Goals are overarching “ends”. They are broadly stated, and not necessarily quantifiable or measurable. They should be clarified and supported by a set of more specific objectives. Indicators are not generally mapped directly to goals.

**Indicators:** metrics that are linked directly to reporting change or expected change in the objectives. Indicators report the extent to which the strategies are effective in influencing the objective. They are the primary indicators to be considered when assessing progress/performance. Indicators are metrics for reporting progress toward objectives or sub-objectives. Progress can be either predicted/modeled or measured/actual.

**Implementation indicator:** metric that links with an objective and is affected by management. Answers the question: Did we do what we said we'd do?

**Objectives:** Objectives are specific ends that must be achieved in support of a goal. They clearly define both an end and a preferred direction, but do NOT prescribe a target. Ideally, a set of objectives will collectively describe all the components that have to be addressed in order to address a goal. Objectives are measurable via indicators and each objective should have an indicator mapped directly to it.

**Strategy:** a means to achieve an end; an action that can be implemented to influence outcomes towards a specific end. The “means” that have been adopted or are being considered for achieving the ends. That is, the actions that can be implemented to achieve or influence the objectives (as reported by the indicators). Strategies could be stated with reference to an indicator and a specified quantitative level for the indicator. **Strategy = implementation indicator + target**

**Subsidiarity:** the principle that tasks and decision-making should be handled by the smallest – in some case, most local – competent authority.

**Target:** a specific quantitative state of an implementation indicator. A specific quantitative state of an indicator associated with a strategy that is either under consideration or has been adopted.

**Validation Monitoring:** metrics that tell us which management actions:

- have been most effective in enhancing management actions
- are likely to be most effective in further enhancing management actions.
- decreases uncertainty about the relationship between indicator and objective. Designed according to experimental standards and used for research, i.e. conventional Adaptive Management. Answers the question: Why did we get the outcome we wanted/achieve our objective, OR why didn't we? What could we do to improve?

## **Appendix D: Context Summary: Coastal Adaptive Management Working Session**

Prepared on October 25, 2007

### ***History of agreements***

Please see the first page of the introduction of the Land Use Plan Summary (p.6) for an excellent review of the how, why, and what of land use agreements in the North and Central Coast. For more information on the Coast Information Team, please see [www.citbc.org](http://www.citbc.org).

For more recent developments, please see the Integrated Land Management Bureau Coastal Land Use Decision Implementation website, at [http://ilmbwww.gov.bc.ca/lup/lrmp/coast/central\\_north\\_coast/index.html/](http://ilmbwww.gov.bc.ca/lup/lrmp/coast/central_north_coast/index.html/). The website includes links to the EBMWG Working Group website and to the actual land use planning documents.

### ***Ecosystem-Based Management***

The Central and North Coast LRMPs and Land Use agreements between First Nations and the Province of BC have committed to full implementation of Ecosystem-Based Management by March 31st, 2009, defined as

"...an adaptive, systematic approach to managing human activities, guided by the Coast Information Team EBM Handbook, that seeks to ensure the coexistence of healthy, fully functioning ecosystems and human communities."<sup>1</sup>

The twin goals of EBM are therefore:

#### Ecological Integrity:

Maintain ecological integrity, where ecological integrity is a quality or state of an ecosystem in which it is considered complete or unimpaired; including the natural diversity of species and biological communities, ecosystem processes and functions, and both the ability to absorb disturbance (resistance) and to recover from disturbance (resilience).

#### Human Well-Being:

Achieve high levels of human well-being, where human well-being is a condition in which all members of society can determine and meet their needs and have a large range of choices and opportunities to fulfill their potential.

### ***Adaptive Management Scope***

The Adaptive Management system that the EBMWG develops and oversees is intended to address all aspects of EBM, with explicit prioritization of key questions and issues. The Land

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<sup>1</sup> For more information on the definition of full EBM implementation, see Appendix E.

Use Plan summary, which summarizes all of the existing Provincial land use decisions, First Nation-Provincial land use agreements and LRMP table recommendations for the region, thus defines the outer bounds of the scope of the AM framework by summarizing all of the objectives, strategies, targets, and indicators related to the above decisions and agreements that could be monitored and improved through adaptive management.

Note also that there are related initiatives that contribute to meeting the objectives outlined in the LUP summary that are outside the scope of land use planning per se, particularly when it comes to improving human well-being. Conservation Financing is one example.

In addition, an initial suite of forestry management requirements (as defined by Schedule F of agreements between the Province and KNT First Nations, and Schedule B of agreements between the Province and Turning Point Coastal First Nations) has been formalized into land use objectives legalized for the Southern Central Coast in July of 2007, and expected shortly for the rest of the Central Coast and the North Coast. These land use objectives (which are summarized in the LUP summary) include specific references to adaptive management, in some cases allowing licensees to adopt a more ecologically risky management strategy if they undertake a few requirements, one of which is an adaptive management plan. For example:

#### Objectives for important fisheries watersheds

- (1) Maintain an equivalent clearcut area of less than 20% in important fisheries watersheds.
- (2) Despite subsection (1), an equivalent clearcut area of more than 20 % may be maintained after:
  - (a) information-sharing or consultation with the applicable First Nation;
  - (b) a coastal watershed assessment or similar assessment of watershed sensitivity to forest development disturbance is completed to relevant professional standards;
  - (c) maintaining an amount, type and distribution of forest cover that is sufficient to sustain natural hydrological and fluvial processes, based on the assessment in subsection (2)(b); and
  - (d) **to the extent practicable, an adaptive management plan is developed and implemented to monitor environmental impacts during any primary forest activity.**

Licensees choosing to manage to the higher ecological risk strategy will be required to develop results and strategies in their FSPs that address the requirement for an adaptive management plan. The EBMWG's adaptive management framework may therefore need to provide guidance for licensees on how to "monitor environmental impacts during any primary forest activity" and how to integrate this research as done by multiple licensees.

## ***Related EBMWG projects to date***

### Implementation partners workshop

A workshop was held in July of 2007 to engage EBM implementation partners in a dialogue on adaptive management, with the intent of informing subsequent discussions on the detailed design of the AM framework, and helping to ensure the long term success of the initiative. The workshop had three specific objectives:

- To build a common understanding about adaptive management
- To get concrete input on key elements of the framework
- To clarify roles and opportunities in implementation.

### Land Use Planning summary

A Land Use Plan Summary was developed to summarize the land use planning goals, objectives, strategies, indicators and targets related to both ecological integrity and human well-being included in the Provincial land use decisions, First Nation-Provincial land use agreements, and LRMP table recommendations that apply to the region. The EBMWG commissioned this summary as a first step in the development of an AM framework. The consultants who developed this document will be presenting an overview on the morning of the 1st.

### Schedule C and G indicators

The EBMWG commissioned a report on human well-being indicators in order to refine the list of indicators that are included in Schedules C and G of Government-to-Government agreements (which are a subset of the human well-being objectives and indicators summarized in the Land Use Plan summary). The report includes a substantial review of the human well-being literature, and the existing indicator frameworks in Canada. The report also provides a full suite of human well-being indicators, and a narrower subset of indicators specifically for Schedules C and G.

### Institutional and Decision-making Context

The formal institutional and decision-making context for coastal land use implementation is outlined below. The institutional context continues to evolve, and each of the groups may choose to do implementation monitoring of its own activities.

## ***Provincial and First Nation Governments***

- Provincial and First Nation governments collaborate to implement land use decisions in accordance with their laws, customs and traditions.
- Provincial resource agencies are responsible for implementing land use objectives and other Provincial decisions according to their legislative mandates (e.g. Land Act, FRPA, Wildlife Act, Park Act) and to monitor implementation and effectiveness.

### ***Land and Resource Forums (LRFs)***

- The LRFs make recommendations to the Provincial and First Nations governments on the further development of EBM and implementation of land use decisions.
- The LRFs provide support to First Nations in implementing land use decisions in their traditional territories.
- The LRFs cooperate on issues related to implementation of land use decisions, including overseeing the work of the EBM WG and providing advice on the recommendations of the NC and CC PIMCs.

### ***EBM Working Group***

- Develops recommendations on EBM research priorities and on the application of research results to the implementation of EBM.
- Oversees research related to uncertainties or knowledge gaps in EBM implementation.
- Coordinates and manages EBM-related data and analysis.
- Develops and coordinates the implementation of a coastal adaptive management framework.

### ***Central and North Coast PIMCs***

- Monitors and evaluates implementation of the land use plan.
- Advises the Province and First Nations through the LRFs on implementation strategies, revisions and issue resolution after assessing social impacts.

## **Appendix E: Definition of “Full Implementation of Ecosystem Based Management by March 31, 2009”**

The members of the of the Joint Land and Resource Forums have agreed, through the Land and Resource Protocol Agreement and the Strategic Land Use Planning Agreement-in-Principle (the “Government-to-Government Agreements”), to achieve “full implementation of EBM by March 31, 2009”. The purpose of the document is to define what is meant by the phrase “full implementation of EBM by March 31, 2009”. This phrase includes two components that require definition: (1) “EBM” and (2) and “full implementation”. The following definitions of these two components provide a framework for achieving full implementation of EBM by March 31, 2009, subject to the completion of government to government discussions arising from the Government-to-Government Agreements and the completion of Detailed Strategic Planning activities, informed as appropriate by the EBM Working Group and Plan Implementation Committees. **Ecosystem Based Management** For the purposes of the Central and North Coast Land and Resource Management Plan areas, EBM is defined in the Government-to-Government Agreements between the various First Nations and Province of British Columbia as: “...an adaptive, systematic approach to managing human activities, guided by the Coast Information Team EBM Handbook, that seeks to ensure the co-existence of healthy, fully functioning ecosystems and human communities;” **Full Implementation** “Full implementation” of EBM by March 31, 2009 will be achieved once the following are in place:

### **1. Governance Framework**

A governance framework that provides an adaptive land use and resource management regime. The framework will include:

- a) government-to-government collaborative arrangements (i.e. FN-BC Land and Resource Forums, FN-BC collaborative management agreements); and
- b) structures and processes for ongoing collaborative and/or consultative stakeholder involvement, including the Plan Implementation Committees and the EBM Working Group.

### **2. Human Well-Being**

Socioeconomic polices and initiatives that seek to achieve a high level of human well-being <sup>1</sup> over time, including:

- a) CIII management and funding mechanisms in place (Coast Economic Development Society Coast and Coast Conservation Endowment Fund Foundation);
- b) Coast Sustainability Trust renewed;
- c) regional economic development policies and initiatives that seek to maintain diversified and viable businesses (forestry, tourism, mining); and
- d) capacity building and management/technical training programs.

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<sup>1</sup> Current agreed upon guidance regarding what constitutes “high level of human well-being” is found in Government-to-Government Agreements and the Coast Information Team EBM Handbook; however this guidance is subject to change through consideration of other information, further research and adaptive management.

### **3. Ecological Integrity**

Conservation measures, including components of integrated Detailed Strategic Plans, that seek to achieve a low level of ecological risk<sup>2</sup> overall in the Central and North Coast, over time, including:

- a) strategic land use zones (conservancies, biodiversity etc) and, as appropriate, related management plans;
- b) landscape reserves (FN cultural areas, OGMAs, UWRs, GWMs); and
- c) land use objectives (cultural, biodiversity, hydriparian, wildlife, etc.), based on review and revision of the initial suite of legal objectives

### **4. Adaptive Management**

A collaborative adaptive management system, informed by recommendations of the EBM Working Group and the Plan Implementation Committees, that will support the further development and implementation of EBM beyond 2009, including:

- a) a system for monitoring and evaluating ecological integrity and human well-being;
- b) an independent research and inventory and data management system; and
- c) a decision support/analysis system.

### **5. Flexibility**

Consistent with provisions in the Government-to-Government Agreements, a suite of flexibility tools that can be used to facilitate transition and sustain First Nation and local community well-being in the Central/North Coast<sup>3</sup>, including:

- a) strategic planning flexibility – i.e. developing and implementing integrated Detailed Strategic Plans that enable management to varying levels of ecological risk in different watersheds and landscapes;
- b) operational flexibility – i.e. in particular management situations, applying risk-managed management objectives and practicability tests, guided by criteria defined in land use objectives and related policies and guidance documents; and
- c) decision variance – i.e. where strategic planning and operational flexibility are insufficient, developing a land use objective that allows for a higher level of resource development activity in specific landscapes and watersheds for a specific period of time.

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<sup>2</sup> Current agreed upon guidance regarding what constitutes “low level of ecological risk” is found in the Coast Information Team EBM Handbook; however the ecological indicators in the EBM Handbook are subject to change through consideration of other information, further research and adaptive management.

<sup>3</sup> Use of the suite of flexibility tools will be consistent with the structures and processes for ongoing collaborative and/or consultative stakeholder involvement developed as part of the EBM Governance Framework.